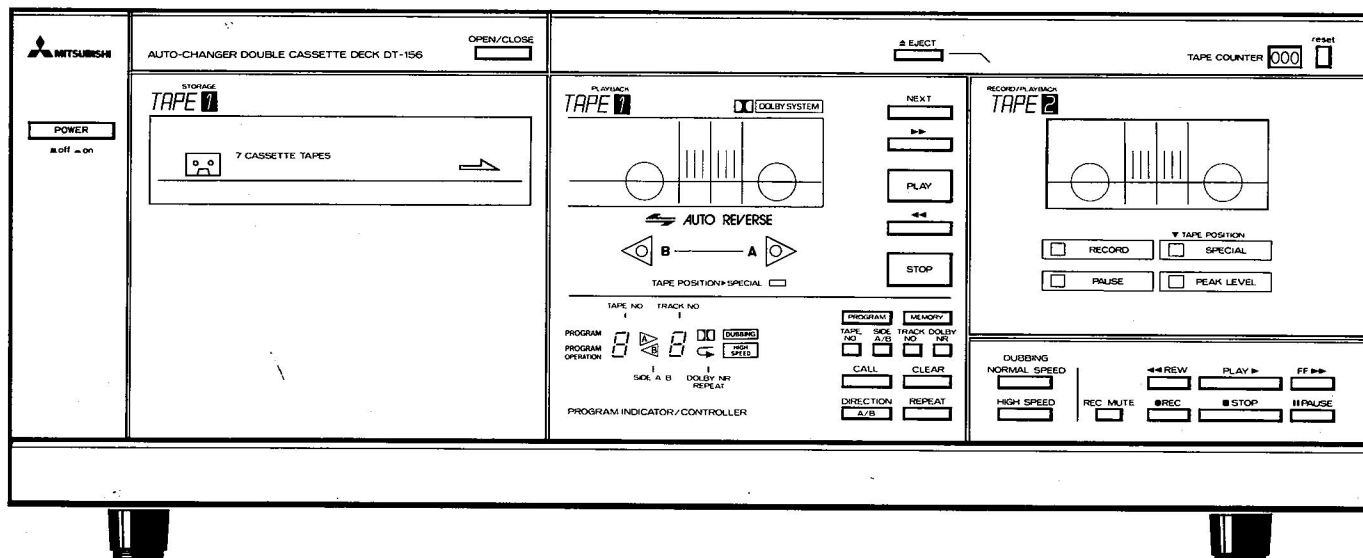




SERVICE MANUAL

AUTO CHANGER DOUBLE CASSETTE DECK

MODEL DT-156

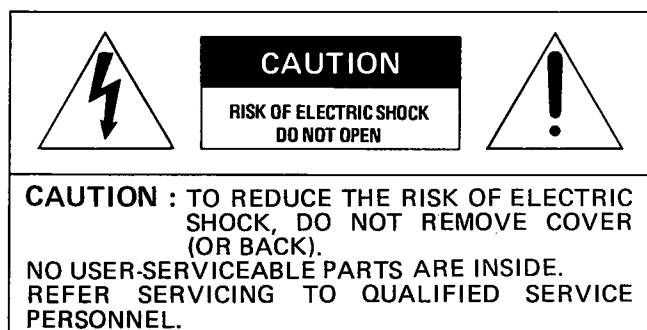


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MITSUBISHI ELECTRIC SALES AMERICA, INC.

5757 Plaza Drive, P.O. Box 6007, Cypress, CA 90630-0007 U.S.A.



The lightning flash with an arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

SPECIAL NOTICE TO SERVICE PERSONNEL

1. In order to insure safe operation of this product after servicing, at least one of the following measurements should be made to determine that exposed parts are acceptably insulated from the supply circuit:

a) Leakage Current

The leakage current shall not be more than 0.5 mA at any accessible part.

b) Grounding Impedance

The impedance of the grounding path at 60 Hz shall not exceed 0.1 ohm when measured from the grounding means of the product to the accessible conductive part.

c) Dielectric Voltage Test

There shall be no evidence of dielectric breakdown as a result of the application of:

- 1) 1080V, 50 or 60 Hz, or 1530V DC for a period of 1 second or.
- 2) 900V, 50 or 60 Hz for a period of 1 minute, between parts involving electric shock and accessible conductive parts.

SPECIFICATIONS

Type 4 track, 2 channel stereo cassette deck
Motor type 2 DC servo motors
4 DC motors

Head Material

REC/PB head (Tape 2) Hard permalloy
PB only head (Tape 1) Hard permalloy
Erase head (Tape 2) Ferrite
Tape speed 4.75 cm/sec (1-7/8 ips)
Tape speed accuracy $\pm 1\%$
Wow and flutter 0.12% Wpeak
Fast forward/Rewind times 110 sec. (C-60 type)
S/N ratio (400 Hz, 3% THD, Weighted, Special tape)

DOLBY NR out 58 dB

DOLBY NR in 68 dB

Frequency response (Record level 160 pwb/mm -30 dB)

Normal tape 30 - 16,000 Hz

Special tape 30 - 17,000 Hz

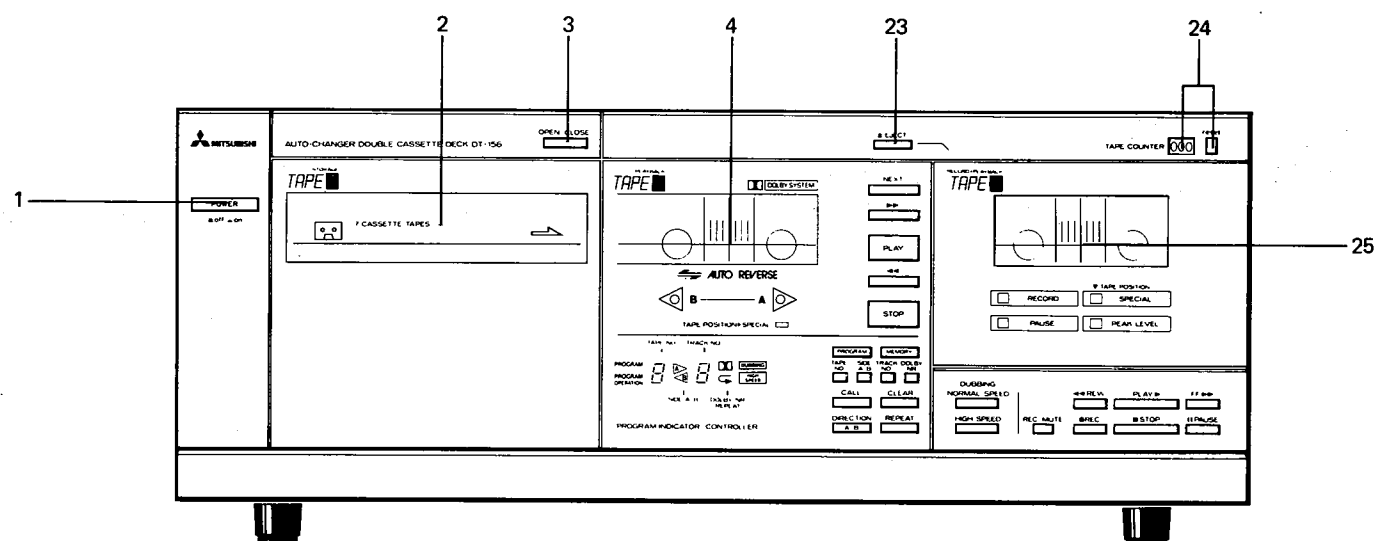
Erase ratio (1 kHz) 60 dB
Input sensitivity/Impedance 90 mV (47k ohms)
Output level 540 mV (22k ohms load)
Power requirement AC 120V, 60 Hz
Power consumption 25 W
Dimensions (W x H x D) 424 x 165 x 300 mm
(16-11/16 x 6-1/2 x 11-13/16")
Weight 8.5 kg (18 lb 11 oz)

Noise Reduction System manufactured under license from Dolby Laboratories Licensing Corporation.

'Dolby' and the double-D symbol are trademarks of Dolby Laboratories Licensing Corporation.

Specifications of this unit are subject to change without notice for improvement.

FRONT PANEL TERMINOLOGY AND FUNCTIONS

**1. Power Switch (POWER)**

Press this switch to turn on the power. Press again to turn off the power.

CAUTION:

This unit is partly connected to AC even if the POWER is in OFF position. Disconnect the power cord when you do not intend to use for a long period of time.

■ TAPE 1 (Playback only)**2. Cassette Magazine**

Up to 7 cassettes can be loaded into the cassette magazine.

3. Cassette Magazine Open and Close Button (OPEN/CLOSE)

Press to open the cassette magazine. Press again to close.

4. Auto Changer Cassette Transport

Cassettes unloaded from the cassette magazine are automatically inserted here for playback.

5. NEXT Button

Press for playback of the next tape in the cassette magazine. During programmed playback, press to switch to the next program.

6. Fast Forward (FF) Button

Press to wind the tape at high speed in the forward direction.

7. PLAY Button

Press to start playback.

8. Rewind (RR) Button

Press to wind the tape at high speed in the reverse direction.

9. STOP Button

Press to stop playback.

10. PROGRAM Button

Press to switch to program mode to begin entry of programmed playback instructions.

11. MEMORY Button

Press to enter programmed playback instructions into memory.

12. TAPE NO. (number) Button

Press to select tape number 1 through 7. The selected tape number is indicated on the display.


13. SIDE A/B Button

Press to select tape side A or B or both. The selected tape direction is indicated on the display.

14. TRACK NO. (number) Button

Press to select track number 1 through 9. The selected track number is indicated on the display.

15. DOLBY NR (noise reduction) Button

Press to select playback with Dolby noise reduction ON or OFF. The Dolby NR symbol () is indicated on the display when Dolby NR is ON.

16. CALL Button

Press to display programmed playback instructions in sequence for programs 1 through 9. When in program mode, press to display programmed playback instructions for the next program.


17. CLEAR Button

When in program mode, press to erase all programmed playback instructions from memory.

18. DIRECTION A/B Button

When in PLAY mode, press to reverse playback direction.

19. REPEAT Button

Press to switch repeat playback function ON. Press again to switch OFF. The repeat symbol () is indicated on the display when the repeat function is ON.

20. Display

This display indicates all tape and program setting functions.

21. A/B Tape Direction Indications**22. Tape Indicator (Special)**

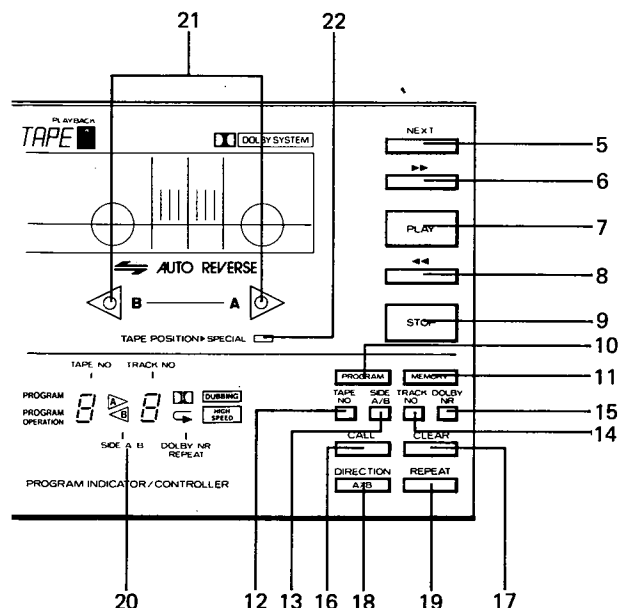
This indicator is illuminated when a Chrome (CrO₂) tape is used. There is no indication for other types of tape.

■ TAPE 2 (Playback/Record)**23. Eject Button (EJECT)**

Press to open the cassette holder.

24. Tape Counter and Reset Button (Tape 2 only)

At the start of recording, push the reset button to set the indications of the tape counter to "000". If you list the recorded pro-



grams and the counter indexing figures, you can easily "cue" a program which you want to hear again.

25. Cassette Holder

Insert the cassette in the holder with the side A facing toward you and the exposed tape side down.

26. Recording Indicator (RECORD)

This indicator is illuminated when the recording mode is in use. (This indicator is illuminated by pressing REC button or Dubbing button.)

27. Tape Indicator (SPECIAL)

See 22.

28. Pause Indicator (PAUSE)

This indicator is illuminated when the unit has been put into the PAUSE mode by pressing the PAUSE button. Pressing the PAUSE button once again will disengage the unit from the PAUSE mode, and the indicator will go out.

29. Peak Level Indicator (PEAK LEVEL)

This indicator shows the peak level of the input signal during recording and the output signal during playback.

30. Rewind Button (◀◀REW)

31. Playback Button (PLAY▶)

32. Fast Forward Button (FF▶▶)

33. Pause Button (||PAUSE)

34. Stop Button (■STOP)

35. Recording Button (RECORD)

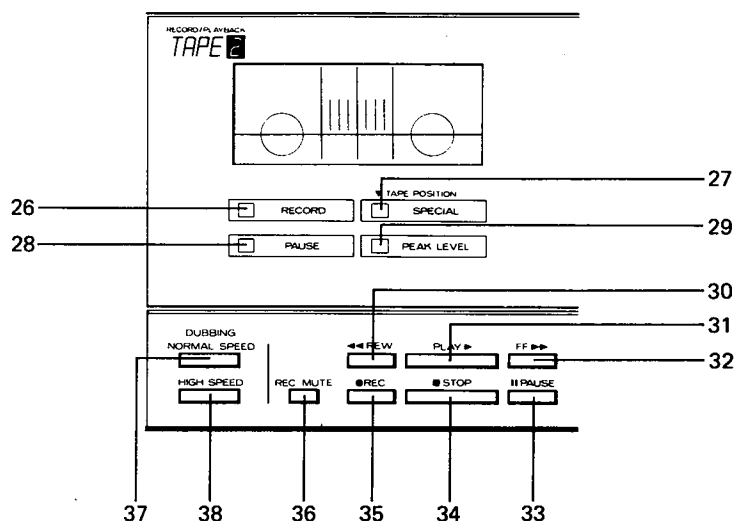
Press to begin recording.

36. Recording Mute Button (REC MUTE)

Press during record to insert a 5 second silent section. After 5 seconds the unit switches to the record standby (pause) mode automatically.

■ Dubbing Buttons (DUBBING)

Press for dubbing from TAPE 1 to TAPE 2.



37. Normal Speed Dubbing Button (NORMAL SPEED)

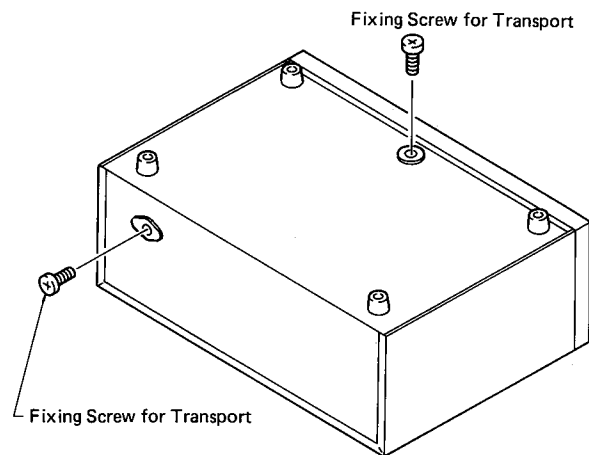
Dubbing at normal speed begins when this button is depressed.

38. High Speed Dubbing Button (HIGH SPEED)

Dubbing at double the normal speed begins when this button is depressed.

BEFORE SERVICING

Before servicing, always remove the fixing screws for transport shown in the figure below. Also, after completion of servicing, always reinstall the fixing screws when transporting the unit in order to avoid problems during transportation.



DISASSEMBLY INSTRUCTIONS

1. Removing the Top Cover

- 1) Remove the 2 screws (1) on the rear of the unit and the screws on each side (2) (2 screws each) as shown in Fig. 1.
- 2) Remove the top cover by sliding to the rear.

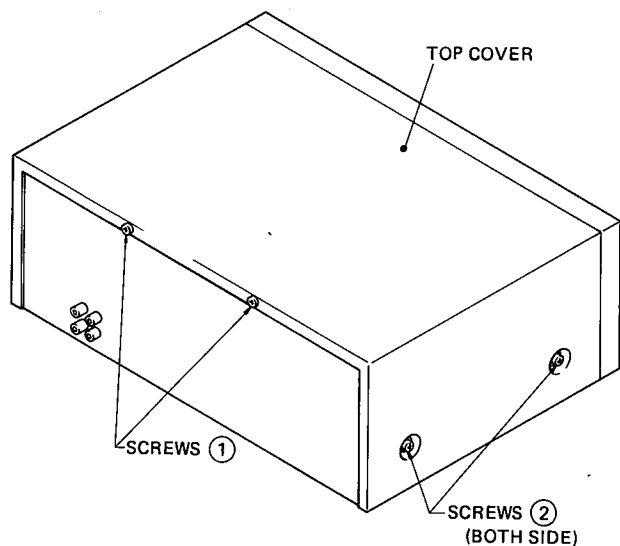


Fig. 1

2. Removing the Front Panel

- 1) After removing the top cover, turn the power on and press the TAPE 1 OPEN/CLOSE button, opening the Cassette Magazine.
- 2) Together with TAPE 1 and TAPE 2 remove the Cassette Cover by lifting it up.
- 3) After closing the TAPE 1 Cassette Magazine, turn the power off.
- 4) Remove each of the 3 screws (3) at the top of the front panel and the 3 screws (4) at the bottom of the front panel.
- 5) After removing the TAPE 2 counter belt (refer to Fig. 2), remove the front panel forward.

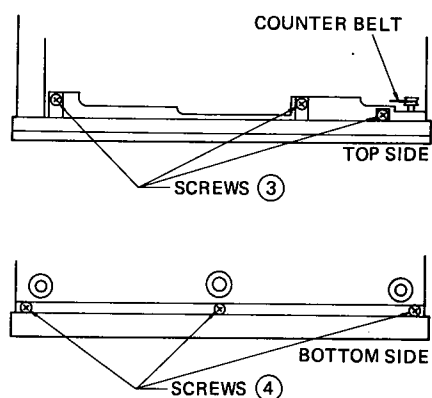


Fig. 2

3. Removing the Bottom Cover

- 1) After removing the front panel, the bottom cover is removed when the 6 screws (5) shown in Fig. 3 are removed.
- 2) The Main P.C.B. can now be serviced.

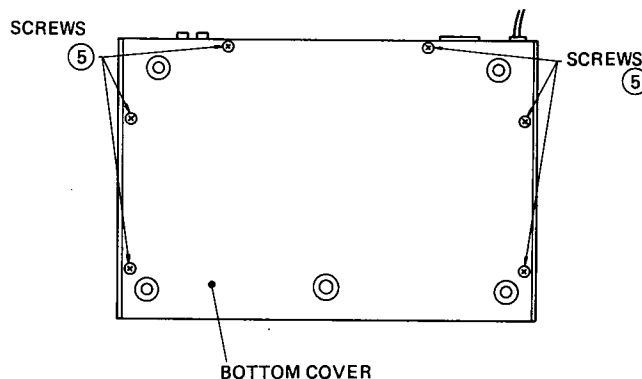


Fig. 3

4. Removing the Magazine Mechanism Ass'y

- 1) Remove the top cover and front panel.
- 2) Remove the 2 screws (6) shown in Fig. 4 and remove the Power Switch P.C.B.
- 3) Remove the 1 screw (7), 2 screws (8) and 6 screws (9) shown in Fig. 4 and remove the rear panel.
- 4) Remove the 3 Magazine Mechanism Ass'y fixing screws (10) on the left side of the unit shown in Fig. 5.
- 5) Remove the OPEN/CLOSE Switch P.C.B. installed on the Front Chassis from the plastic rivet (refer to Fig. 6).
- 6) Remove the 4 Program Switch P.C.B. fixing screws (11) and remove the Program Switch P.C.B. by sliding to the left.

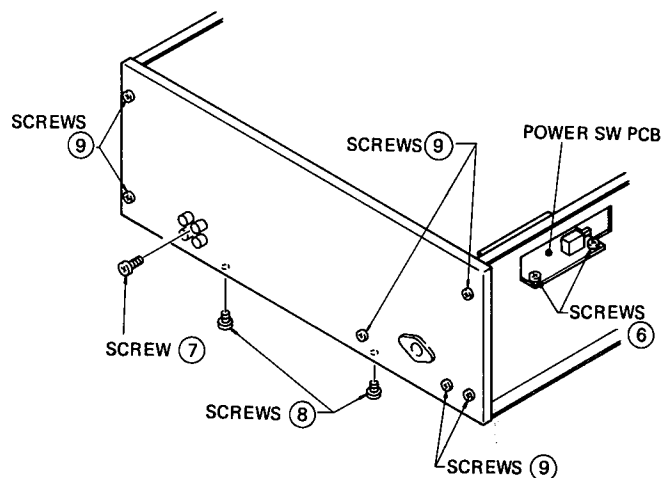


Fig. 4

- 7) Remove the 3 Magazine Mechanism Assembly fixing screws (12) shown in Fig. 6.
- 8) Remove the seven wires running from the power transformer to the Main P.C.B., and remove the wiring (connector) running from the Magazine Mechanism Ass'y to the Main P.C.B.
- 9) When the 3 Magazine Mechanism Ass'y fixing screws (13) shown in Fig. 7 are removed, the Magazine Mechanism can be removed.

LEFT SIDE OF SET

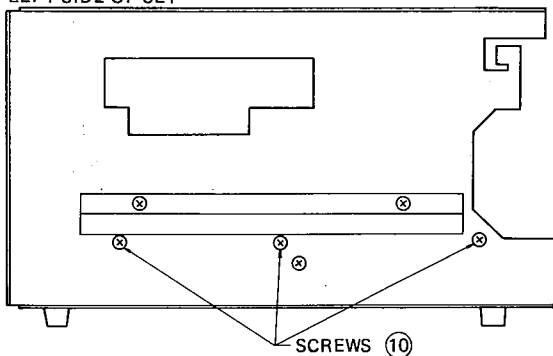


Fig. 5

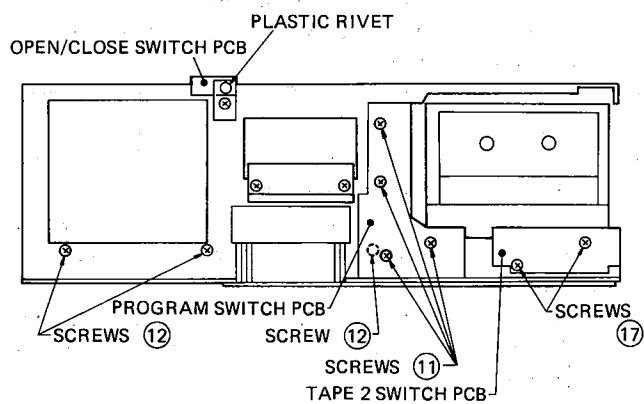


Fig. 6

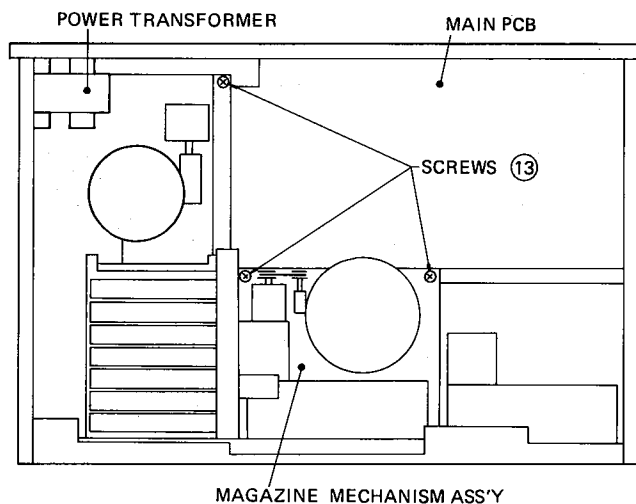


Fig. 7

5. Removing the TAPE 1 Mechanism

5.1 Removing the Tape 1 Mechanism Ass'y

- 1) Remove the Magazine Mechanism Ass'y according the method outlined earlier in 4.
- 2) Remove the two screws (14) and remove the Cassette Loading Rail.
- 3) Remove the two screws (15) and remove the Cassette Guide.
- 4) Remove the four screws (16) and remove the Tape 1 Mechanism.

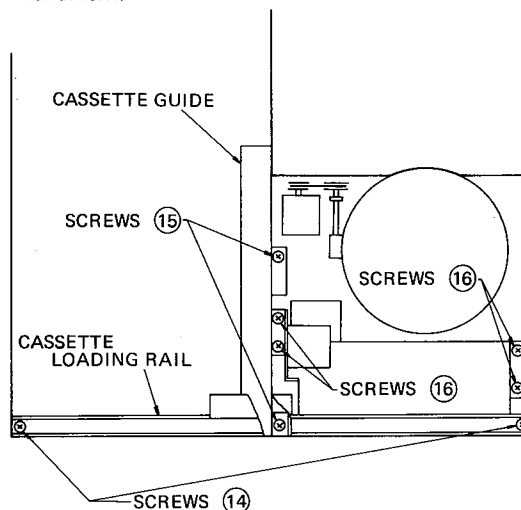
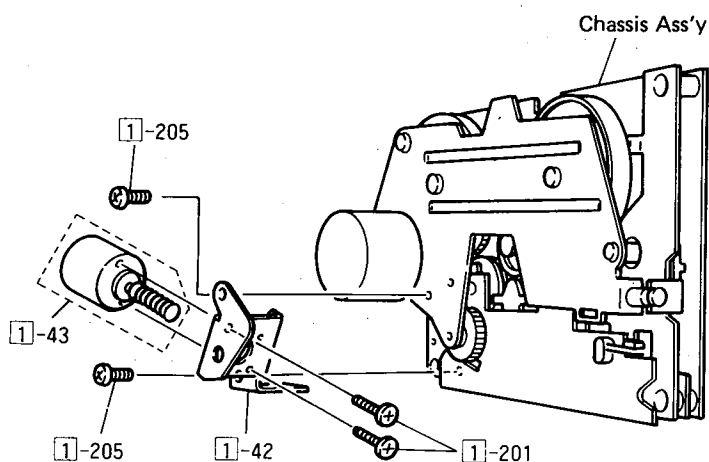


Fig. 8

5.2 Removing the Tape 1 Mechanism

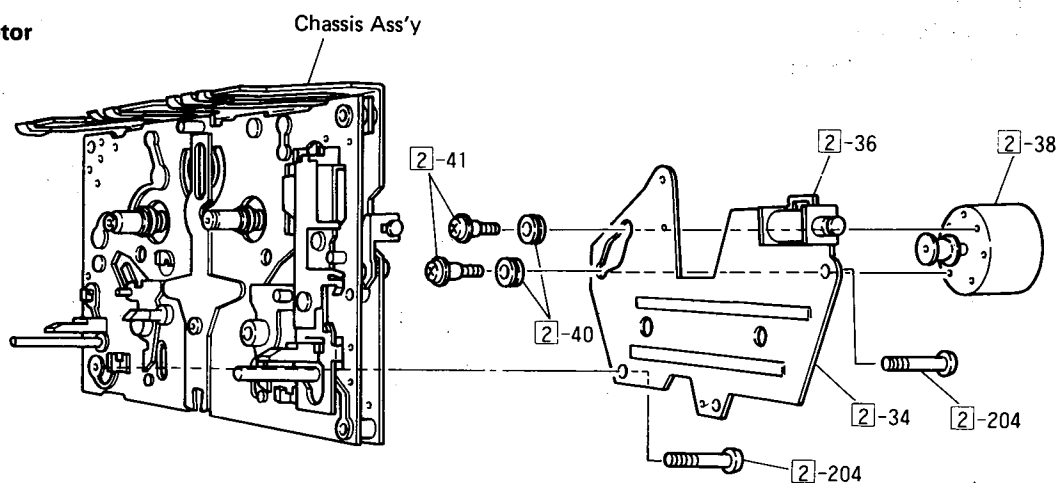
• Rear Side of Mechanism

1) 1-43 Cam Motor



2) 2-34 Motor Base

2-38 Capstan Motor



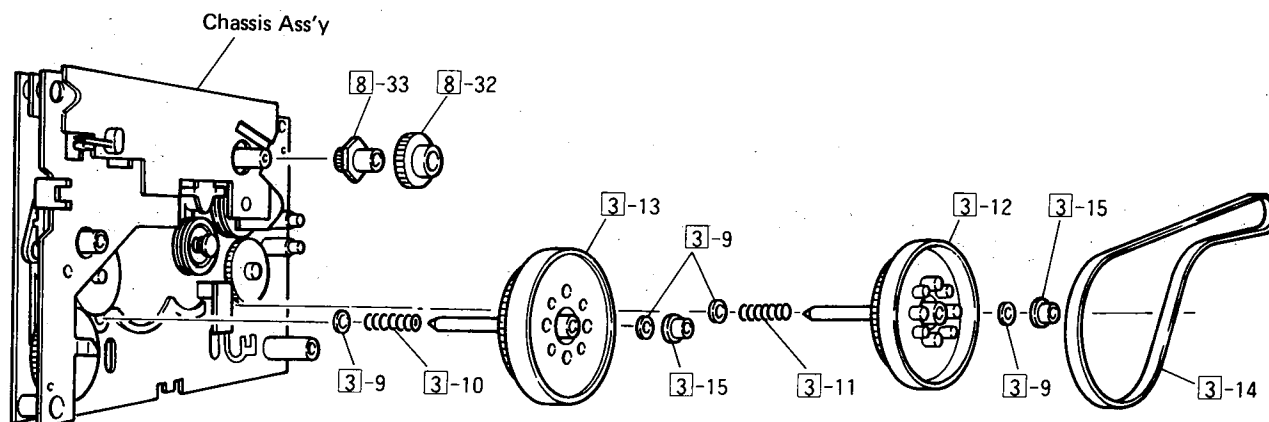
3) 3-12 Flywheel A

3-13 Flywheel B

3-14 Main Belt

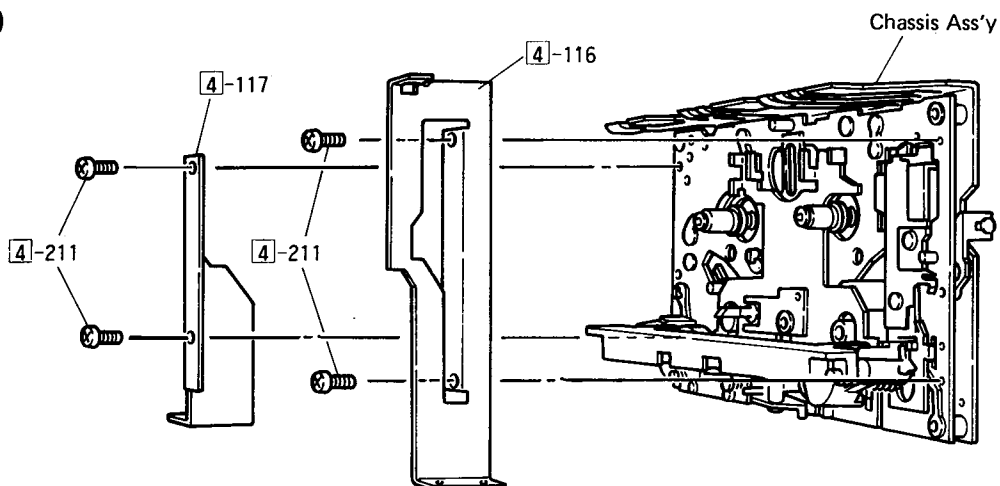
8-32 Gear H

8-33 Gear G

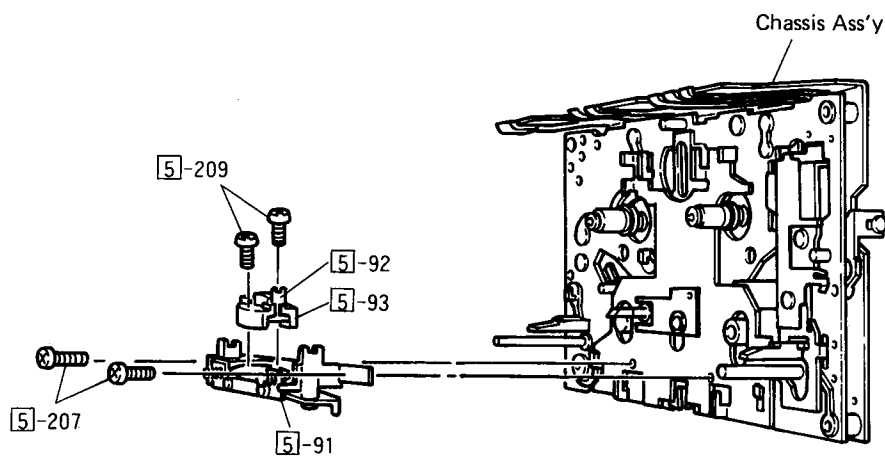


• Front Side of Mechanism

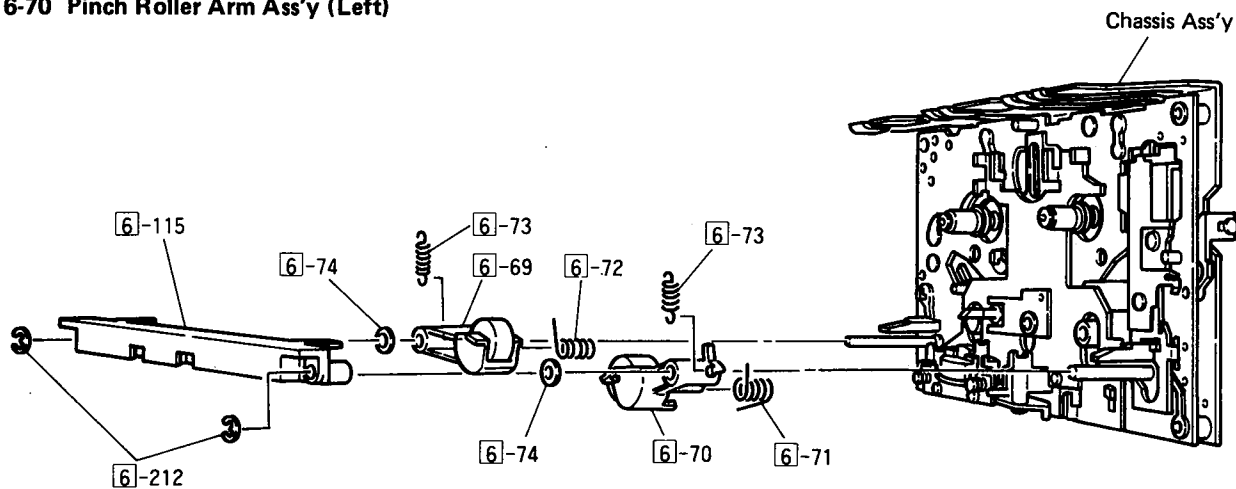
- 1) 4-116 Holder (Right)
4-117 Holder (Left)



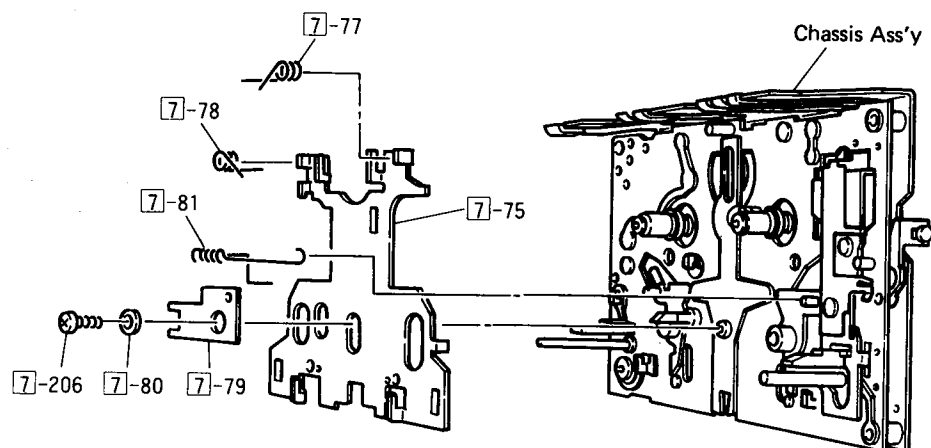
- 2) 5-91 Head Stand
5-92 R/P/E Head
5-93 Head Holder Ass'y



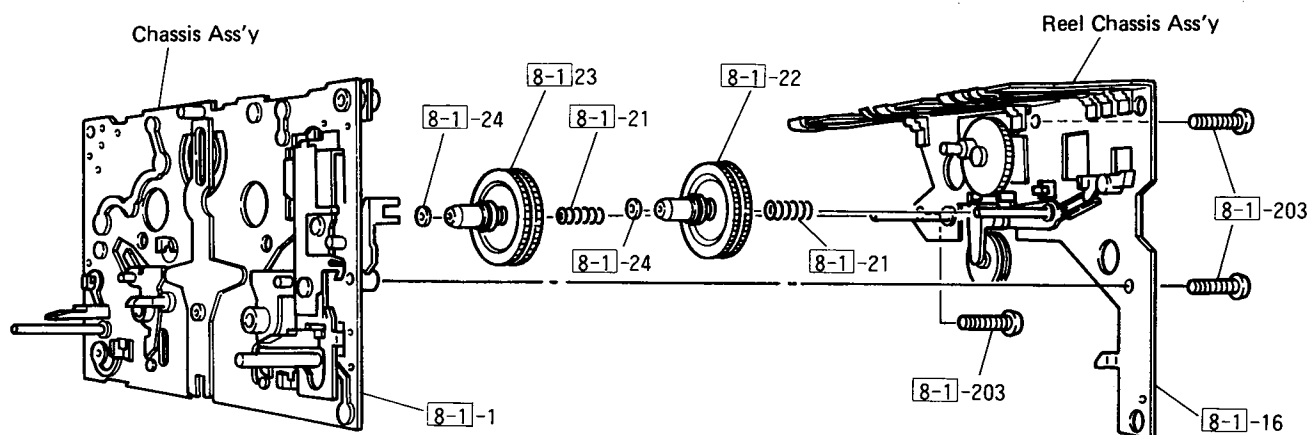
- 3) 6-69 Pinch Roller Arm Ass'y (Right)
6-70 Pinch Roller Arm Ass'y (Left)



4) 7-75 Head Base



- 5) 8-1-1 Chassis Ass'y
 8-1-16 Reel Chassis Ass'y
 8-1-22 F Reel Ass'y
 8-1-23 R Reel Ass'y



6. Removing the TAPE 2 Mechanism

6.1 Removing the Tape 2 Mechanism Ass'y

- 1) Remove the top cover and front panel.
- 2) Remove the 4 screws (11) and 2 screws (17) shown in Fig. 6 and remove the Program P.C.B. and the Tape 2 Switch P.C.B.
- 3) Remove the 4 Tape 2 Mechanism fixing screws (18) shown in Fig. 9.
- 4) When the wires (connectors) running from the Tape 2 Mechanism to the Main P.C.B. are removed, the Tape 2 Mechanism can be removed by pulling it forward.

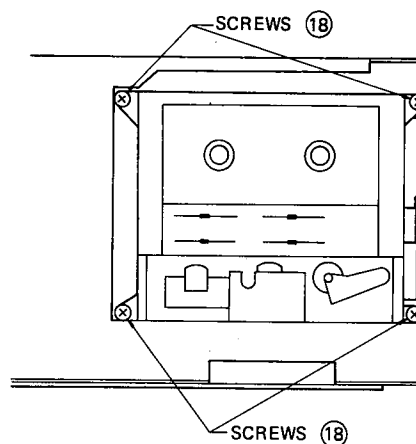


Fig. 9

6.2 Removing the Counter Belt

- 1) Open up the shaft part of the cassette holder and remove the cassette holder. Do not apply excess pressure at this time as this can bend the cassette holder.
- 2) When the Decoration Plate is removed by removing the 2 screws (19) shown in Fig. 10, the Counter Belt can be replaced.

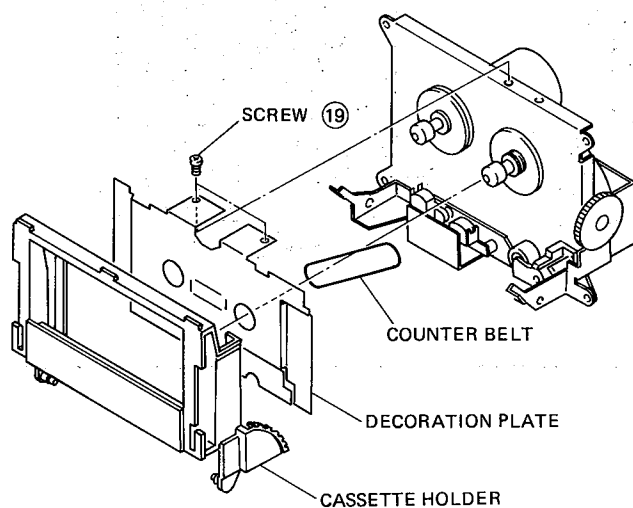


Fig. 10

6.3 Removing the R/P Head, Erase Head, and Pinch Roller

- 1) Remove the R/P head shield plate by removing the 2 fixing screws.
- 2) When the fixing screws of each head are removed (2 screws each), the R/P Head and Erase Head can be removed. After replacing the playback head, always lock the fixing screws in place after carrying out Head Azimuth adjustment.
- 3) Remove the Case Holder by removing the 2 fixing screws.
- 4) The pinch roller is held in place with a latch; remove by opening the latch.

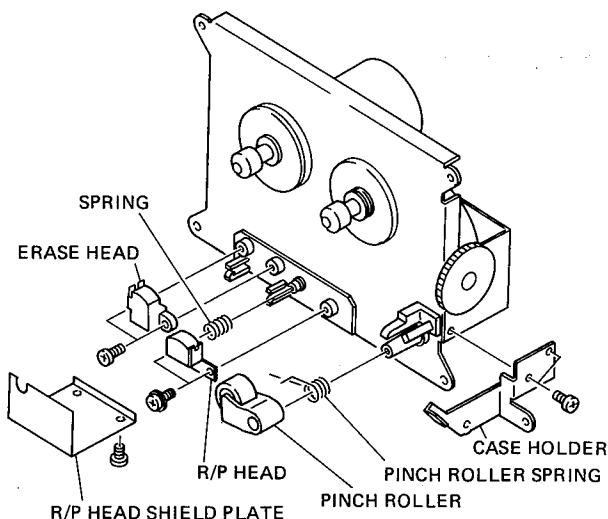


Fig. 11

6.4 Removing the Main Motor, Main Belt, Reel Motor, and Solenoid

- 1) Remove the Motor Holder (A) by removing the 3 fixing screws.
- 2) With the unit in this condition the Main Belt and Flywheel can be removed.
- 3) The Main Motor can be removed from the Motor Holder by removing the 3 fixing screws.
- 4) The Reel Motor can be removed by removing the 2 fixing screws.
- 5) The Solenoid can be removed by removing the 2 fixing screws from the front after removing the Solenoid from the front Supply Reel.

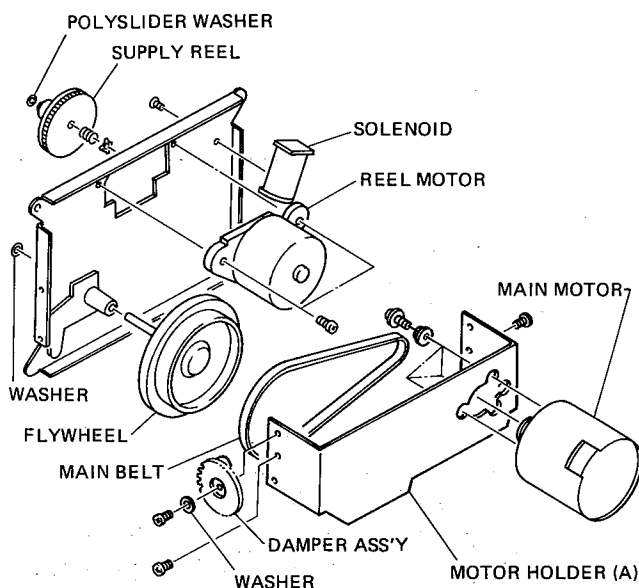


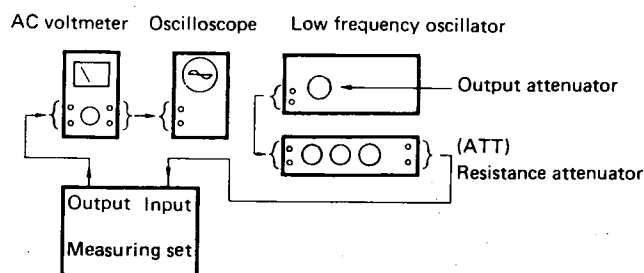
Fig. 12

ADJUSTMENTS

Measurement Devices Required

1. Frequency Oscillator 20 Hz to 20 kHz or more
2. Resistance Attenuator 0 dB to 90 dB
3. AC Voltmeter
4. Frequency Counter
5. Oscilloscope
6. Test Tape
 - (1) TCC-112 (MTT-111) ; 3 kHz, -10 dB
 - (2) TCC-130 (MTT-150) ; 400 Hz Dolby-B Type
 - (3) TCC-173A (MTT-125C)
 - (4) AC-512 ; Special Blank
7. Distortion Meter

Meter Connection Method



Adjustments Essentials

1. Tape Speed

1.1 High Speed

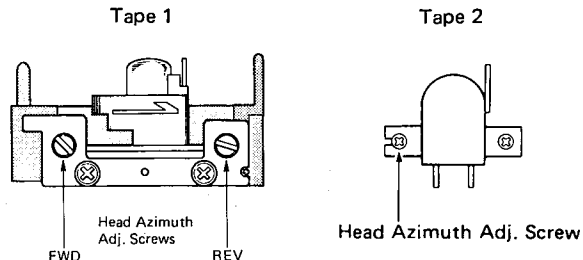
- 1) Setup Connect a frequency counter to the output jack.
- 2) Test Tape TCC-112 (MTT-111) ; 3 kHz
- 3) Adjustment Point TAPE 1; VR421,
TAPE 2; VR423
- 4) Adjustment Procedure TAPE 1: Press the HI SPEED button and play back the tape, adjusting VR412 so that $V_{T1} = 6020 \pm 10$ Hz.
TAPE 2: After pressing both the PLAY and ►► buttons simultaneously and turning the power switch on, press the HI SPEED key and adjust VR423 so that the value at this time is $V_{T2} = 6000 \pm 10$ Hz.

1.2 Normal Speed

- 1) Setup Same as in 1.1
- 2) Test Tape Same as in 1.1
- 3) Adjustment Point TAPE 1: VR422,
TAPE 2: VR424
- 4) Adjustment Procedure TAPE 1: Play back the tape and adjust VR422 so that $V_{T1} = 3030 \pm 10$ Hz.
TAPE 2: Play back the tape and adjust VR424 so that the value at this time is $V_{T2} = 3010 \pm 10$ Hz.

2. Head Azimuth Adjustment

- 1) Setyp Refer to Meter Connection Method
- 2) Test Tape TCC-173A (MTT-215C)
- 3) Adjustment Point Head Azimuth Adjustment Screws
- 4) Adjustment Procedure Play back the tape with output at maximum and adjust so that both sides are equal (i.e., the difference between sides A and B is within 10 dB).



3. PB Output Level Adjustment

- 1) Setup Connect an AC voltmeter to the Pin 15 of IC720 (Lch) and IC820 (Rch).
- 2) Test Tape TCC-130 (MTT-150)
- 3) Adjustment Point TAPE 1: VR550 (Lch),
VR650 (Rch)
TAPE 2: VR501 (Lch),
VR601 (Rch)
- 4) Adjustment Procedure Play back the tape and adjust so that output is $58 \text{ mV} \pm 0.25 \text{ dB}$.

4. Adjustments Related to Recording

4.1 Bias Frequency Adjustment

- 1) Setup Connect a frequency counter to the R501 (Lch) and R601 (Rch) circular terminals.
- 2) Adjustment Point OSC Unit
- 3) Adjustment
 Procedure Adjust so that the bias frequency is $105 \text{ kHz} \pm 0.3 \text{ kHz}$.

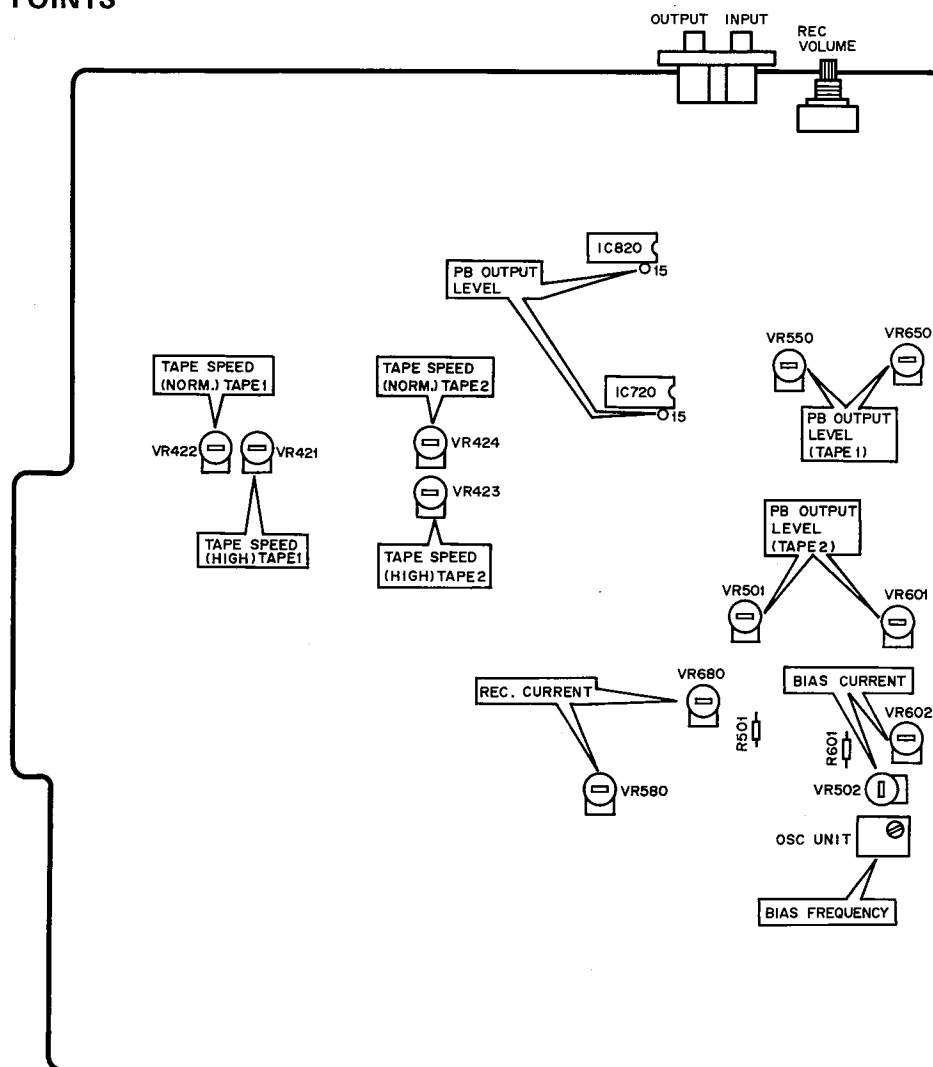
4.2 Recording Current Adjustment

- 1) Test Tape AC512 (Special)
- 2) Adjustment Point VR580 (Lch), VR680 (Rch)
- 3) Adjustment
 Procedure Adjust so that the level when a 400 Hz signal is record and play back after putting the unit on rated record and dropping the input level 30 dB is the same as the monitor level.

4.3 Bias Current Adjustment

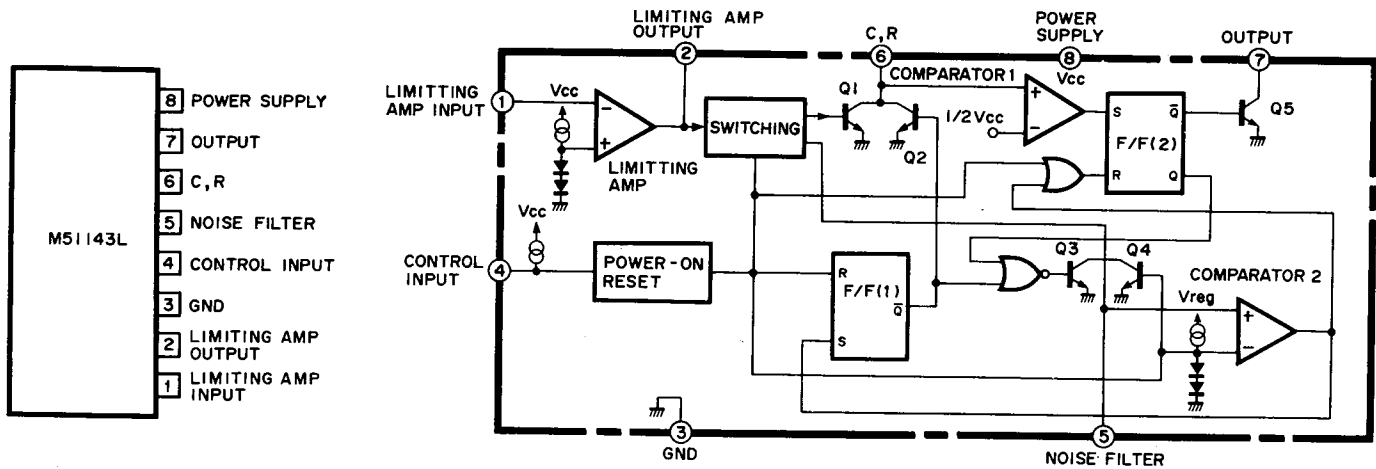
- 1) Test Tape AC512 (Special)
- 2) Adjustment Point VR502 (Lch), VR602 (Rch)
- 3) Adjustment
 Procedure Lower the input level 25 dB after setting the unit to the rated recording values. Adjust so that the level difference when a 1 kHz signal is record and play back and a 6.3 kHz signal is record and play back is within $\pm 0.5 \text{ dB}$.

ADJUSTMENT POINTS

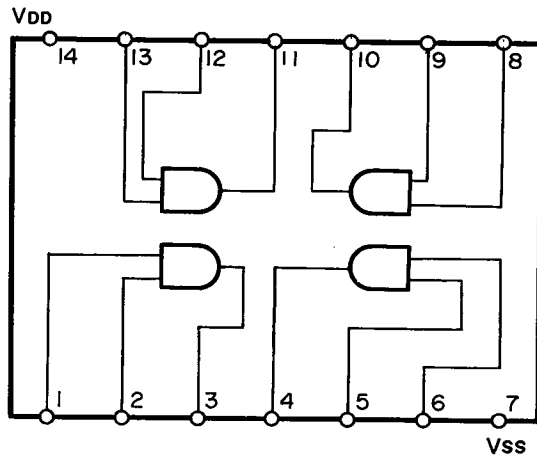
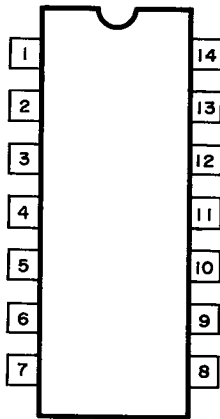


INTERNAL DIAGRAMS AND PINOUT OF INTEGRATED CIRCUITS

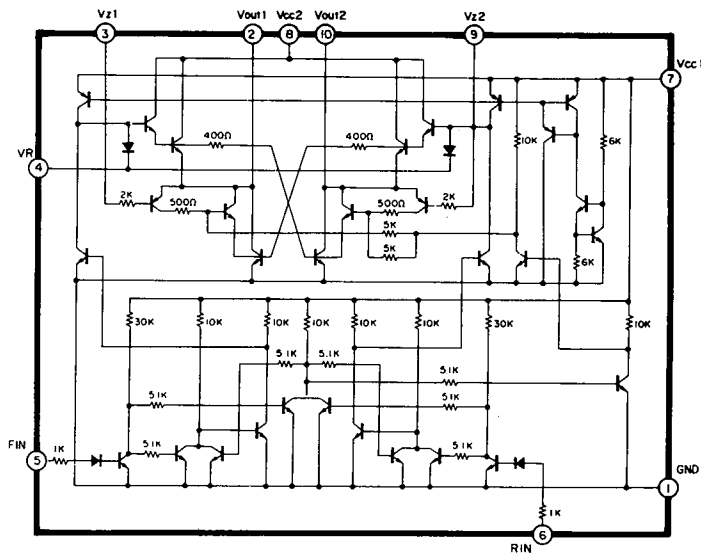
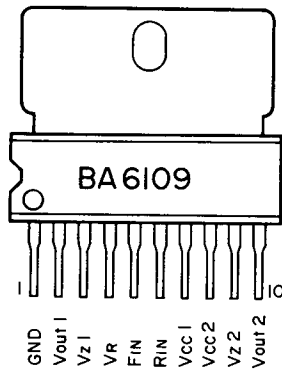
IC401 : M51143AL ; MRPS

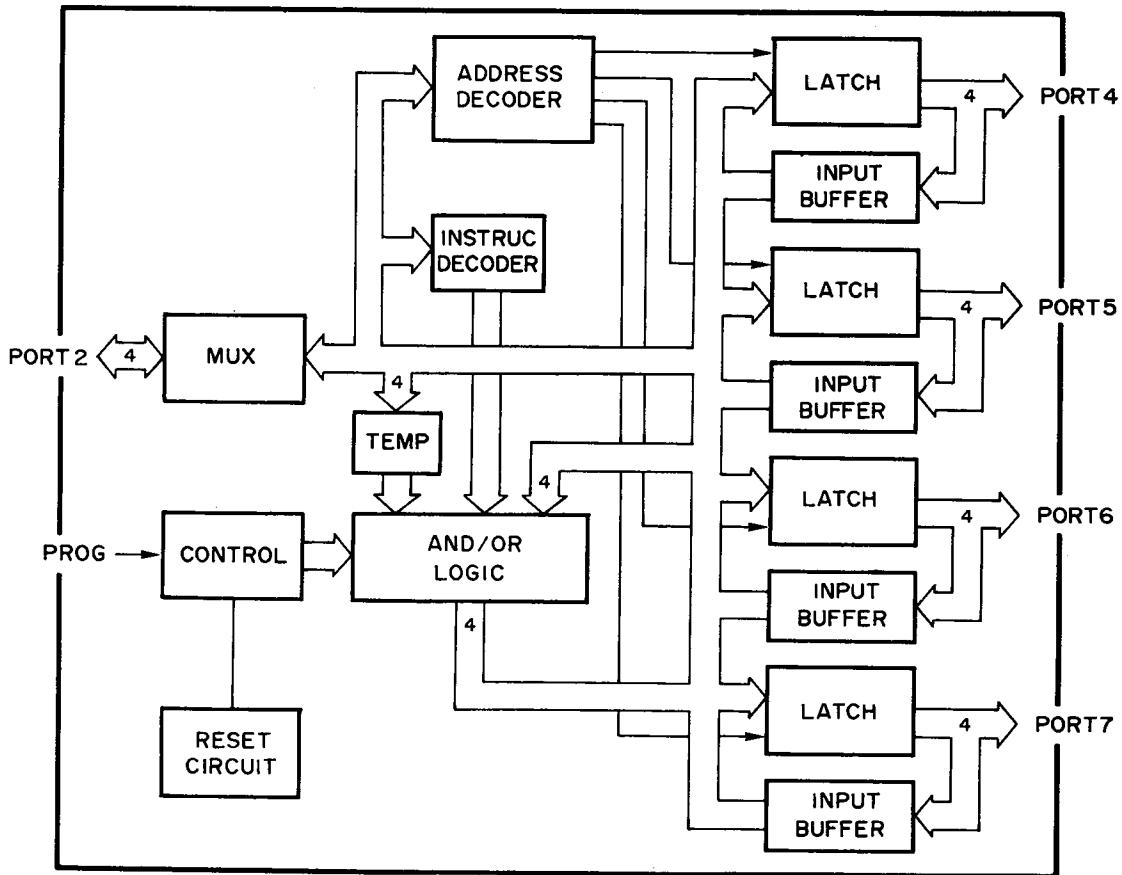
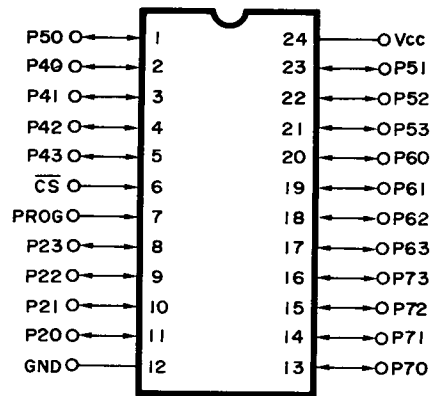


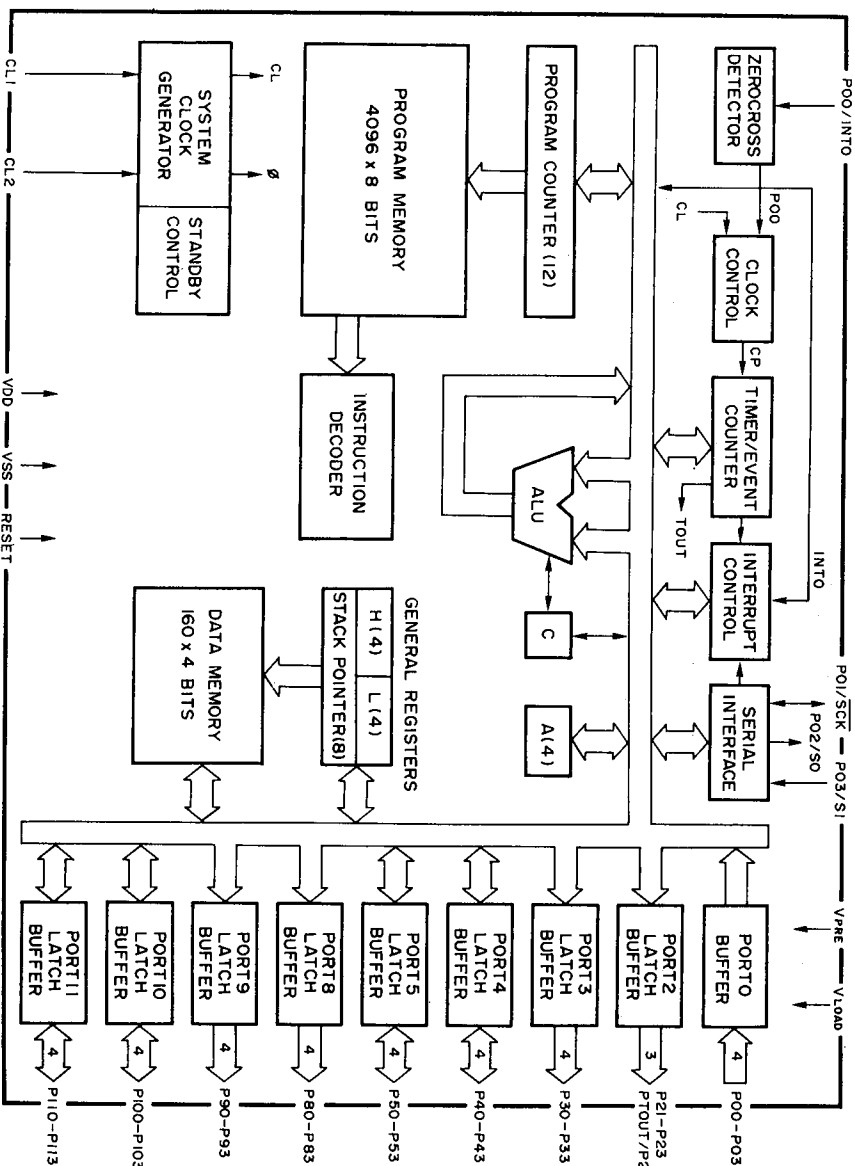
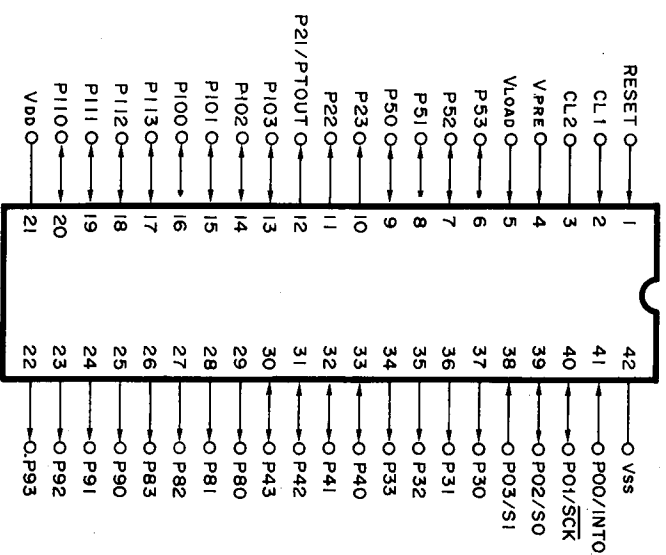
IC421, 424 : BU4081B



IC425, 426, 427, 428 : BA6109B ; MOTOR DRIVE



IC423 : μ PD8243C ; TAPE 1 MECHANISM CONTROL

IC420 : μ PD7538C-025/ μ PC7538C-033 ; MYCONTerminal Function of μ PD7538C

Terminal nomenclature	Input/output	Functions	RESET functions
P00/INTO	Input	4-bit input terminal for port 0 (4-bit input port). Also function as external interruptor input (INTO), zero cross detector input, serial clock input/output (SCK), serial data output (SO), and serial data input (SI).	Input
P01/SCK	Input/output		
P02/SO	Input/output		
P03/SI	Input		
P21/PTOUT	Output	3-bit high voltage resistant output terminal for port 2 (3-bit output port). Also function as TOUT (PTOUT).	Low output when a pull-down resistor is used. High impedance open drain output.
P22, P23			
P30-P33	Output	4-bit high voltage resistant output terminal for port 3 (4-bit output port).	
P40-P43	Input/output	4-bit high voltage resistant input/output terminal for port 4 (4-bit input/output port).	
P50-P53	Input/output	4-bit high voltage resistant input/output terminal for port 5 (4-bit input/output port).	
P80-83P	Output	4-bit high voltage and current resistant output terminal for port 8 (4-bit output port). Bit set/reset possible through SPBL and RPBL commands.	
P90-P93	Output	4-bit high voltage and current resistant output terminal for port 9 (4-bit output port). Bit set/reset possible through SPBL and RPBL commands.	
P100-P103	Input/output	4-bit high voltage and current resistant input/output terminal for port 20 (4-bit input/output port). Bit set/reset possible through SPBL and RPBL commands.	
P110-P113	Input/output	4-bit high voltage and current resistant input/output terminal for port 11 (4-bit input/output port). Bit set/reset possible through SPBL and RPBL commands.	
CL1, CL2		Connection terminal for clock oscillation ceramic oscillator or crystal oscillator. CL1 is the external clock input.	
RESET	Input	Reset input.	
VPRE		Negative power supply for high voltage resistant preamplifier driver. (Port 2-5, 8-11)	
VLOAD		Negative power supply for optional load resistor of high voltage resistant preamplifier driver. (Port 2-5, 8-11)	
VDD		Positive power supply.	
VSS		GND electric potential.	

*NOTE:

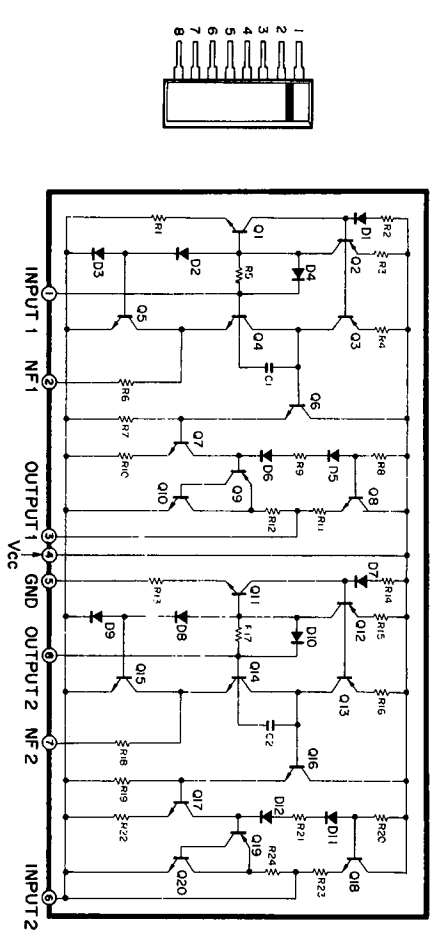
1. Open drain output or a pull-down resistor (load resistor) can be selected as a mask option for the output drivers of ports 2-5 and 8-11. VLOAD power supply indicates that a pull-down resistor is being used.
2. Ports 2-5 are suitable for the segment signal output of the fluorescent display tube, and ports 3-11 are suitable for the digit signal output of the fluorescent display tube.
3. Since ports 8-11 have high current driving capabilities, these can be used to directly drive LEDs.

IC442 : M52065 ; TAPE 2 MECHANISM CONTROL

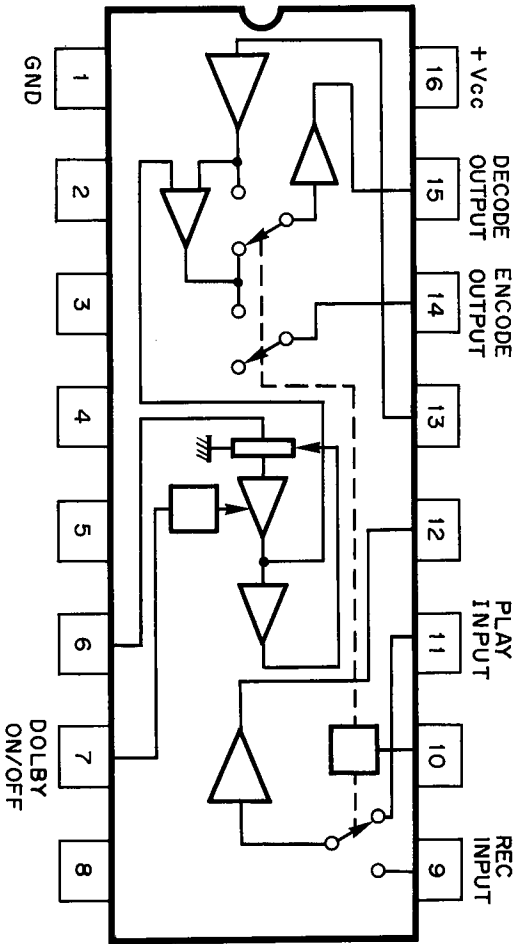
Terminal Function Table for M52065

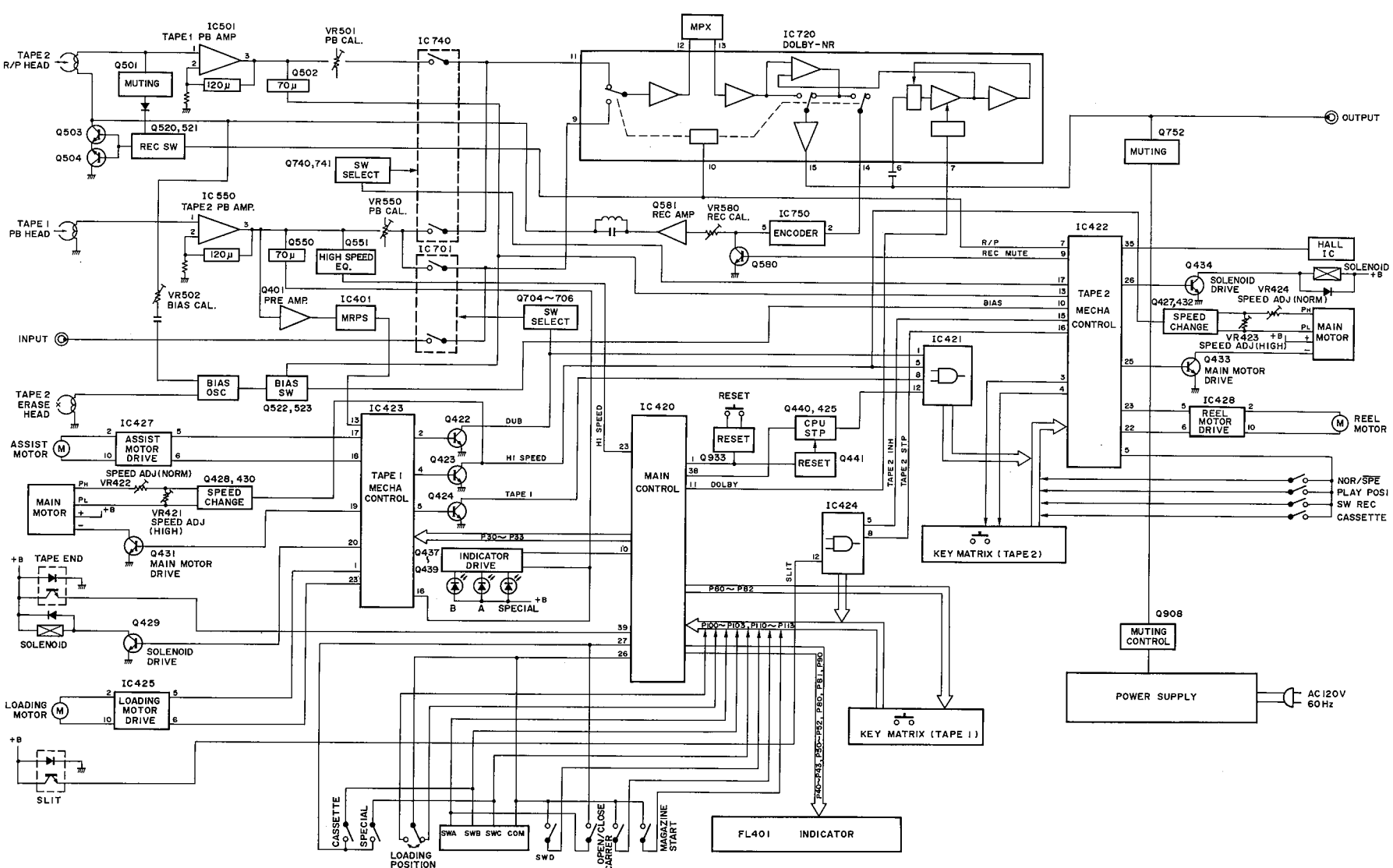
Terminal No.	I/O	Signal Name	Input Type	Active H/L	Operation Function
3 R0 6 R3	O	KEY SCAN	Pulse	H	Key scan signal
7 R4	O	PLAY/REC	Level	H/L	Tape 2 Play/Rec switch signal Play: "H", Rec: "L"
8 R5	O	PLAY MUTE	Level	L	Play mute signal Play: "H", for all else "L"
9 R6	O	REC MUTE	Level	H	Rec mute signal Rec: "H", for all else "L"
10 R7	O	BIAS CONT	Level	H	Rec bias control signal
12 R9	O	REC LED	Level	H	For Rec LED light
13 R10	O	SPECIAL LED	Level	H	For Special LED light
14 R11	O	PAUSE LED	Level	H	Play/Pause, Rec/Pause light ASPS flash
15 R12	O	INHIBIT	Level	H	Tape 1 control signal
16 R13	O	DUBBING • STOP	Level	H	Tape 1 control signal
17 R14	O	TAPE 2 PLAYING	Level	H	"H" for when Tape 2 is in play mode
22 O4	O	M-REW	Level	L	Mechanism control signal (reel motor)
23 O3	O	M-FF	Level	L	Mechanism control signal (reel motor)
24 O2	O	M-CONT	Level	H	Mechanism control signal (Normal/FF (REW) switch)
25 O1	O	C-MOTOR	Level	H	Mechanism control signal (capstan motor)
26 O0	O	M-PL	Level	H	Mechanism control signal (PL ON/OFF)
28 K8 31 K1		STOP	Tact	H	Mechanism operation button, Stop
		PLAY	Tact	H	Mechanism operation button, playback start
		FF	Tact	H	Mechanism operation button, Fast forward
		PWD	Tact	H	Mechanism operation button, Rewind
		PAUSE	Tact	H	Mechanism operation button, Play/Rec Pause
		REC	Tact	H	Mechanism operation button, Rec start
		REC MUTE	Tact	H	Mechanism operation button, 5-second non-recording
		NO/SP	Leaf	H/L	Normal: "H", Special: "L"
		PLAY SW	Leaf	H	Head position detection for Play
		REC TAB	Leaf	H	Accidental recording prevention
		CASS DET	Tact	H	Cassette tape presence detection
		TAPE 1 PLAY	Level	H	Tape 2 play stop Prohibits Tape 2 Play
		NOR/HIGH	Level	H	Normal/High speed switching signal High speed: "H"
		V REDUCTION	Level	H	Detects voltage reduction lowers head base
		DUBBING	Level	H	Tape 2 dubbing control signal
35 J1	I	TAPE END	Pulse	H/L	Tape end detect

IC501, 550 : M51522L ; PRE AMP.



IC720, 820 : μPC1210C ; DOLBY NR

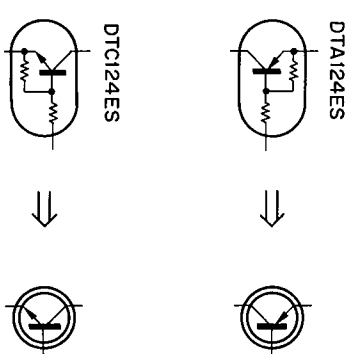





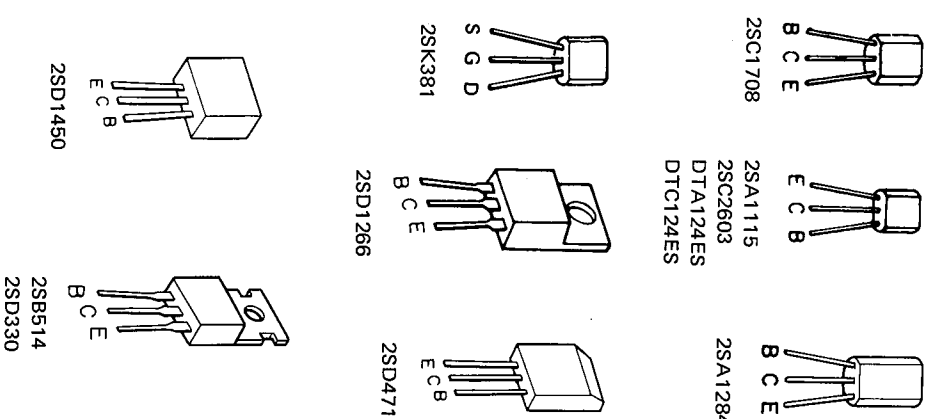
SCHEMATIC DIAGRAM

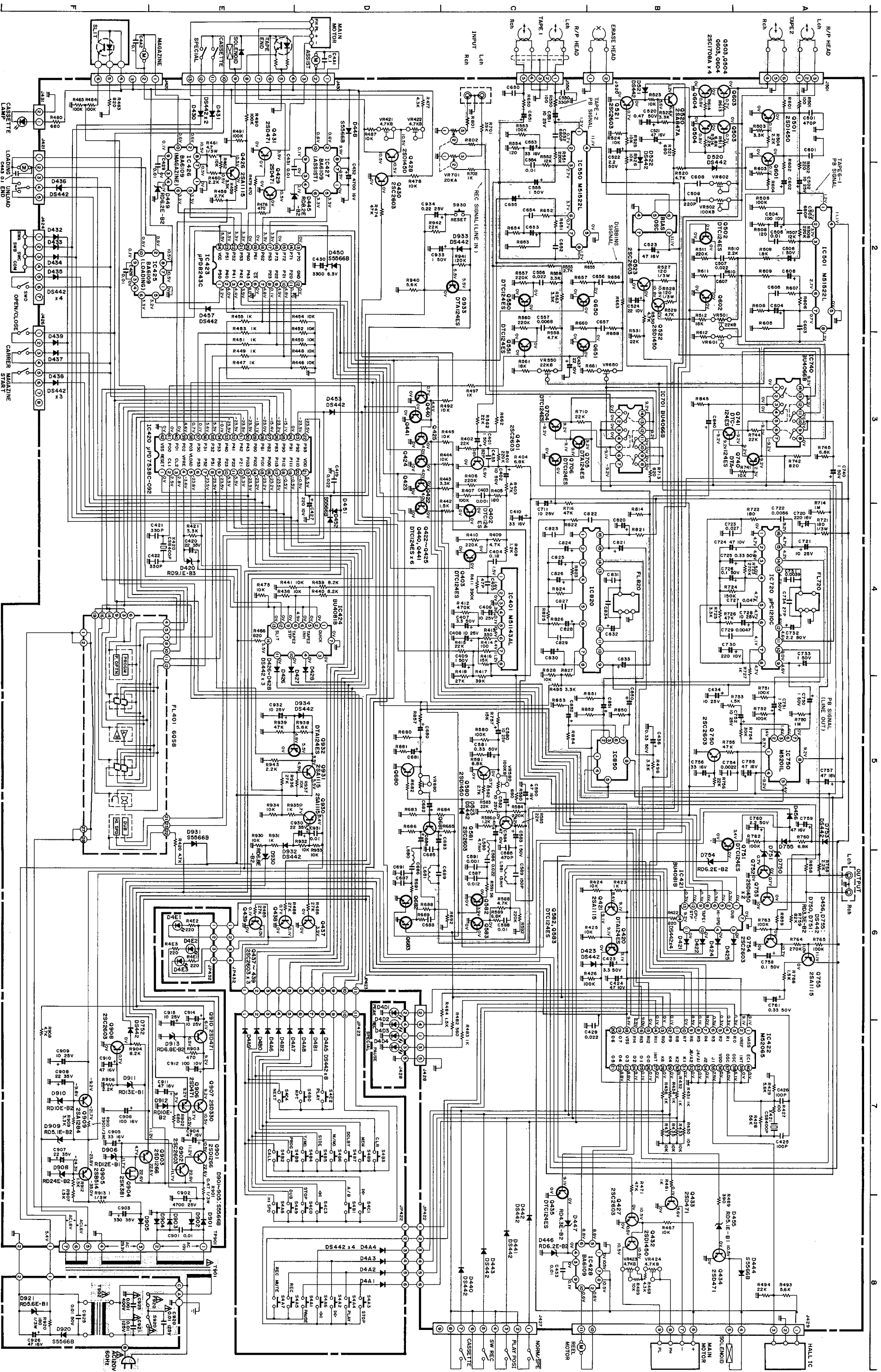
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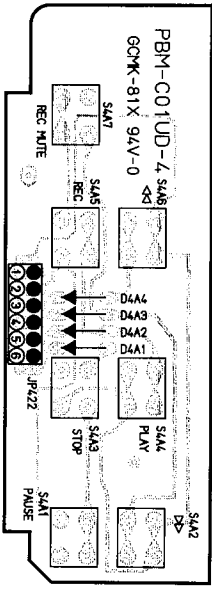
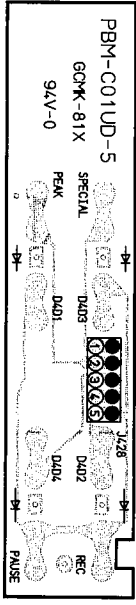
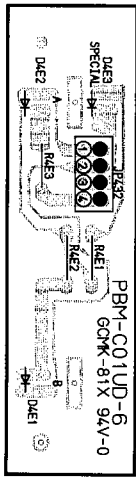
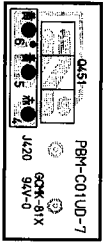
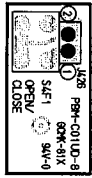
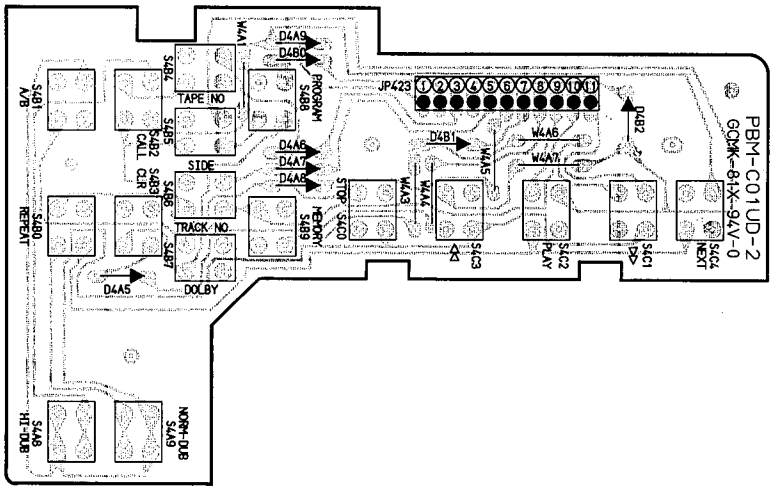
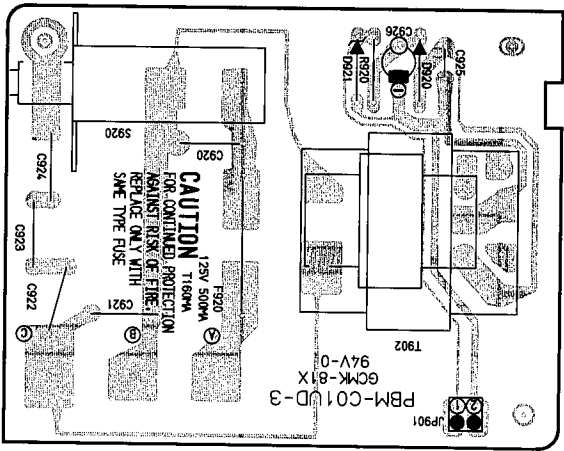
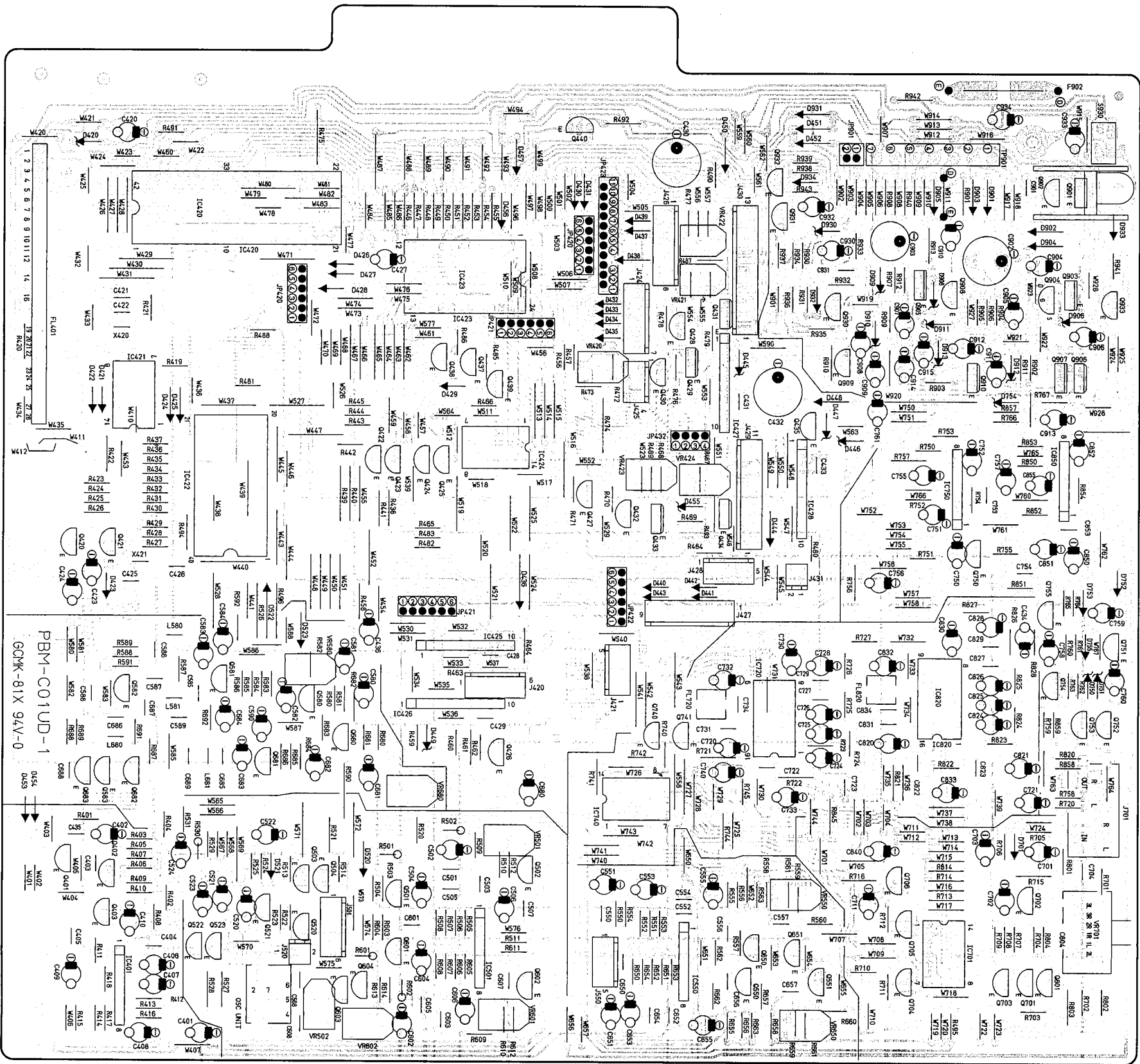
1. Units of capacitor and resistors
Capacitors : No symbol : μF /voltage resistance
P symbol : pF
- Resistors : No symbol : ohms
K symbol : k ohms
M symbol : M ohms
- Undesignated resistors are 1/4W - J rank.
2. The voltage marking is that measured with a 1 M ohm digital voltmeter.
3. Transistors DTA124ES and DTC124ES are indicated on the schematic diagram by the following symbols:



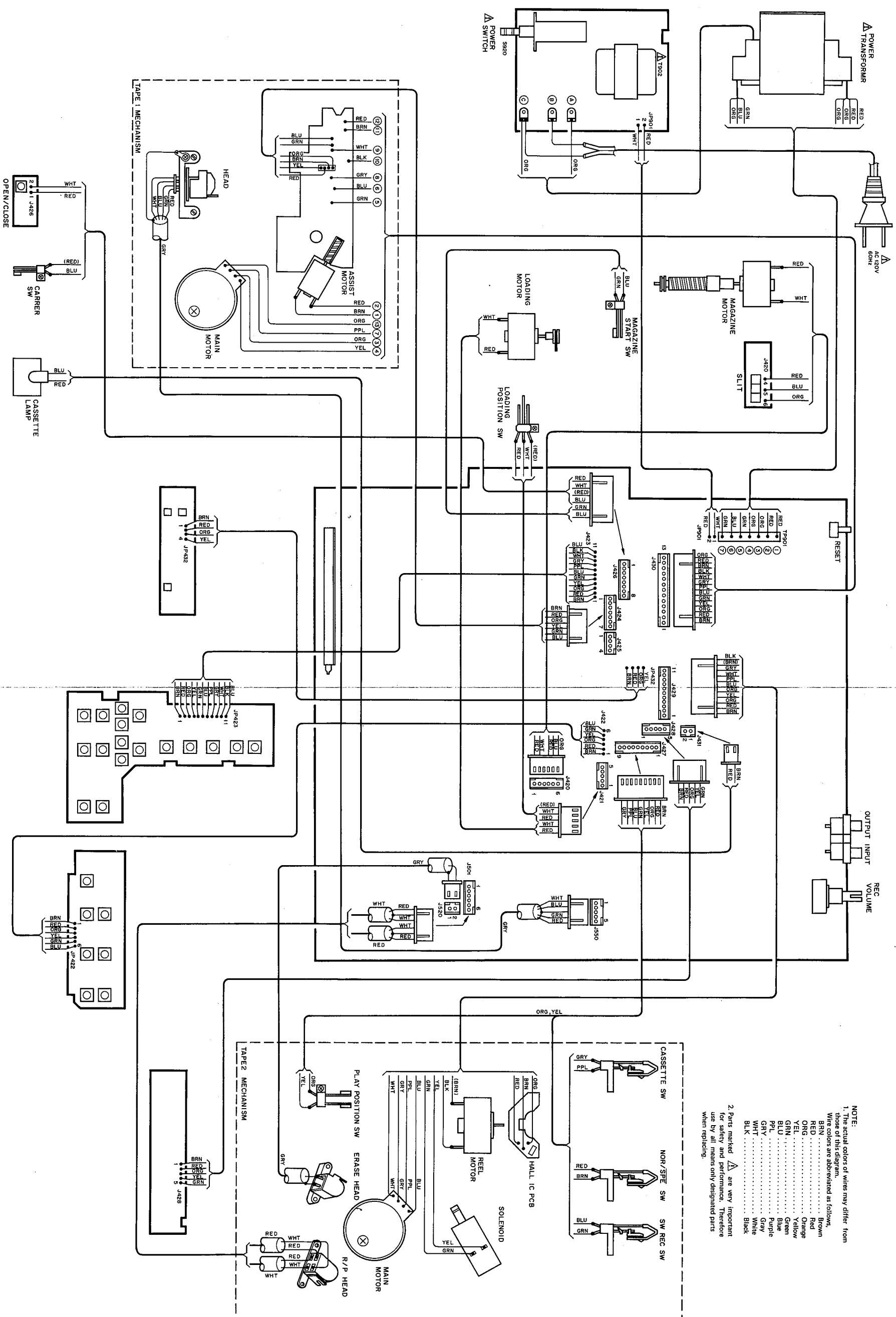
4. Parts marked with Δ and  are extremely important for safety and the maintenance of performance. Be sure to replace them only with the designated proper replacement parts.
5. This circuit diagram is only the basic schematic, and therefore the constants may change depending on later modifications carried out in the circuitry.








WIRING DIAGRAM





NOTE:

1. The actual colors of wiles may differ from those of this diagram.
Wire colors are abbreviated as follows:

RED	Brown
ORNG	Red
YEL	Orange
GRN	Yellow
BLU	Green
PPL	Blue
GRY	Purple
WHI	Gray
BLK	White
	Black
2. Parts marked  are very important for safety and performance. Therefore use by all means only designated parts when replicating.

PARTS LIST

NOTE:  and  designates components on the Parts list that have special characteristics to maintain the safety performance of this unit. When replacing any of these parts, be sure to use only specified parts.

Symbol No.	Parts No.	Description
Diodes		
D420	M05232322	RD9.1E-B3
D421	M05208327	DS442
D422	M05208327	DS442
D423	M05208327	DS442
D424	M05208327	DS442
D425	M05208327	DS442
D426	M05208327	DS442
D427	M05208327	DS442
D428	M05208327	DS442
D430	M05208327	DS442
D431	M05208327	DS442
D432	M05208327	DS442
D433	M05208327	DS442
D434	M05208327	DS442
D435	M05208327	DS442
D436	M05208327	DS442
D437	M05208327	DS442
D438	M05208327	DS442
D439	M05208327	DS442
D440	M05208327	DS442
D441	M05208327	DS442
D442	M05208327	DS442
D443	M05208327	DS442
D444	M05255320	S5566B
D445	M05232327	RD8.2E-B2
D446	M04177321	RD6.2E-B2
D447	M05A09322	RD4.3E-B2
D448	M05255320	S5566B
D449	M04177321	RD6.2E-B2
D450	M05255320	S5566B
D451	M05255320	S5566B
D452	M05255320	S5566B
D453	M05208327	DS442
D455	M05A09323	RD5.1E-B1
D456	M05208327	DS442
D457	M05208327	DS442
D4A1	M05208327	DS442
D4A2	M05208327	DS442
D4A3	M05208327	DS442
D4A4	M05208327	DS442
D4A5	M05208327	DS442
D4A6	M05208327	DS442
D4A7	M05208327	DS442
D4A8	M05208327	DS442
D4A9	M05208327	DS442
D4B0	M05208327	DS442
D4B1	M05208327	DS442
D4D1	M05A09325	LED LN01201C (RED);PEEK
D4D2	M05A09325	LED LN01201C (RED);REC
D4D3	M05A09326	LED LN01301C (GRN);SPECIAL
D4D4	M05A09327	LED LN01401C (ORG);PAUSE
D4E1	M05A09328	LED LN350GP-LS (GRN);TAPE B
D4E2	M05A09328	LED LN350GP-LS (GRN);TAPE A
D4E3	M05A09328	LED LN350GP-LS (GRN);SPECIAL
D520	M05208327	DS442
D521	M05208327	DS442
D522	M05208327	DS442
D750	M05A09321	RD3.3EB2

Symbol No.	Parts No.	Description
D751	M05A09321	RD3.3EB2
D752	M05208327	DS442
D753	M05208327	DS442
D754	M04177321	RD6.2E-B2
D755	M05208327	DS442
D901	M05255320	S5566B
D902	M05255320	S5566B
D903	M05255320	S5566B
D904	M05255320	S5566B
D905	M05255320	S5566B
D906	M04200322	RD12E-B1
D908	M04A01325	RD24EB2
D909	M04176320	RD5.1E-B2
D910	M05A09320	RD10EB2
D911	M04200324	RD13E-B1
D912	M05A09320	RD10EB2
D913	M05A09324	RD6.8E-B2
D920	M05255320	S5566B
D921	M05232329	RD5.6E-B1
D931	M05255320	S5566B
D932	M05208327	DS442
D933	M05208327	DS442
D934	M05208327	DS442
Transistors		
Q401	M07390303	2SC2603 (2320)
Q402	M04200302	DTC124ES
Q403	M04200302	DTC124ES
Q420	M04200300	DTA124ES
Q421	M07390304	2SA1115 (999)
Q422	M04200302	DTC124ES
Q423	M04200302	DTC124ES
Q424	M04200302	DTC124ES
Q425	M04200302	DTC124ES
Q426	M07390304	2SA1115 (999)
Q427	M07390303	2SC2603 (2320)
Q428	M04200301	2SD1450 (R)
Q429	M05147311	2SD471
Q430	M07390303	2SC2603 (2320)
Q431	M05147311	2SD471
Q432	M04200301	2SD1450 (R)
Q433	M05147311	2SD471
Q434	M05147311	2SD471
Q435	M04200302	DTC124ES
Q437	M07390303	2SC2603 (2320)
Q438	M07390303	2SC2603 (2320)
Q439	M07390303	2SC2603 (2320)
Q440	M04200302	DTC124ES
Q441	M04200302	DTC124ES
Q501	M04200301	2SD1450 (R)
Q502	M04200302	DTC124ES
Q503	M07113310	2SC1708 (F)
Q504	M07113310	2SC1708 (F)
Q520	M07140303	2SA847
Q521	M07390303	2SC2603 (2320)
Q522	M04200301	2SD1450 (R)



Symbol No.	Parts No.	Description
Q523	M07390303	2SC2603 (2320)
Q550	M04200302	DTC124ES
Q551	M04200302	DTC124ES
Q580	M04200301	2SD1450 (R)
Q581	M07390303	2SC2603 (2320)
Q582	M04200302	DTC124ES
Q583	M04200302	DTC124ES
Q601	M04200301	2SD1450 (R)
Q602	M04200302	DTC124ES
Q603	M07113310	2SC1708(F)
Q604	M07113310	2SC1708(F)
Q650	M04200302	DTC124ES
Q651	M04200302	DTC124ES
Q680	M04200301	2SD1450(R)
Q681	M07390303	2SC2603 (2320)
Q682	M04200302	DTC124ES
Q683	M04200302	DTC124ES
Q704	M04200302	DTC124ES
Q705	M04200300	DTA124ES
Q706	M04200302	DTC124ES
Q740	M04200300	DTA124ES
Q741	M04200302	DTC124ES
Q750	M07390303	2SC2603 (2320)
Q751	M04200302	DTC124ES
Q752	M04200301	2SD1450 (R)
Q753	M04200301	2SD1450 (R)
Q754	M07390303	2SC2603 (2320)
Q755	M07390304	2SA1115 (999)
Q901	M05255301	2SD1266
Q902	M07390303	2SC2603 (2320)
Q903	M05255301	2SD1266
Q904	M05255300	2SK381
Q905	M05200310	2SB514
Q906	M05147311	2SD471
Q907	M07151310	2SD330
Q908	M07390303	2SC2603 (2320)
Q909	M04184300	2SA1284
Q910	M05147311	2SD471
Q930	M07390304	2SA1115 (999)
Q931	M07390304	2SA1115 (999)
Q932	M04200300	DTA124ES
Q933	M04200300	DTA124ES
ICs		
IC401	M05A01333	M51143AL
IC420	M05A09314	UPD7538C-092
IC421	M05A09311	BU4081B
IC422	M05A09313	M52065
IC423	M04200314	UPD8243C
IC424	M05A09311	BU4081B
IC425	M07527343	BA6109
IC426	M07527343	BA6109
IC427	M07527343	BA6109
IC428	M07527343	BA6109
IC501	M05183344	M51522L
IC550	M05183344	M51522L

Symbol No.	Parts No.	Description
IC701	M05A09310	BU4066B
IC720	M04A01312	UPC1210C
IC740	M05A09310	BU4066B
IC750	M05A09312	M5201L
IC820	M04A01312	UPC1210C
IC850	M05A09312	M5201L
Electrical Parts		
C920	M05A09431	C-Ceramic 125V, 0.01 μ F
C921	M05A09431	C-Ceramic 125V, 0.01 μ F
C923	M05A09430	C-Ceramic 400V, 0.001 μ F
F920	M05A09450	Fuse 500mA
FL401	M05A09340	Tube FL
FL720	M05A09445	Filter
FL820	M05A09445	Filter
L580	M05A09511	Choke coil 472J
L581	M05A09510	Choke coil 153J
L680	M05A09511	Choke coil 427J
L681	M05A09510	Choke coil 153J
S4A1	M05A09355	SW-push (PAUSE); Tape 2
S4A2	M05A09355	SW-Push (FF); Tape 2
S4A3	M05A09355	SW-Push (STOP); Tape 2
S4A4	M05A09355	SW-Push (PLAY); Tape 2
S4A5	M05A09355	SW-Push (REC); Tape 2
S4A6	M05A09355	SW-Push (REW); Tape 2
S4A7	M05A09355	SW-Push (REC MUTE); Tape 2
S4A8	M05A09355	SW-Push (HI-SPEED); Tape 1
S4A9	M05A09355	SW-Push (DUBBING); Tape 1
S4B0	M05A09355	SW-Push (REPEAT); Tape 1
S4B1	M05A09355	SW-Push (A/B); Tape 1
S4B2	M05A09355	SW-Push (CALL); Tape 1
S4B3	M05A09355	SW-Push (CLEAR); Tape 1
S4B4	M05A09355	SW-Push (T/No.); Tape 1
S4B5	M05A09355	SW-Push (SIDE); Tape 1
S4B6	M05A09355	SW-Push (M/No.); Tape 1
S4B7	M05A09355	SW-Push (DOLBY); Tape 1
S4B8	M05A09355	SW-Push (PROGRAM); Tape 1
S4B9	M05A09355	SW-Push (MEMORY); Tape 1
S4C0	M05A09355	SW-Push (STOP); Tape 1
S4C1	M05A09355	SW-Push (FF); Tape 1
S4C2	M05A09355	SW-Push (PLAY); Tape 1
S4C3	M05A09355	SW-Push (REW); Tape 1
S4C4	M05A09355	SW-Push (NEXT); Tape 1
S920	M05A09356	Power SW
S930	M05A09357	Tact SW (RESET)
	M04200354	SW-Push (OPEN/CLOSE)
T901	M05A09500	Trans-Power (MAIN)
T902	M05A09501	Trans-Power (BACK-UP)
VR421	M05A09410	VR-Semi 4.7KB
VR422	M05A09410	VR-Semi 4.7KB
VR423	M05A09410	VR-Semi 4.7KB
VR424	M05A09410	VR-Semi 4.7KB
VR501	M05A09411	VR-Semi 22KB
VR502	M05A09412	VR-Semi 100KB
VR550	M05A09411	VR-Semi 22KB
VR580	M05A09412	VR-Semi 100KB

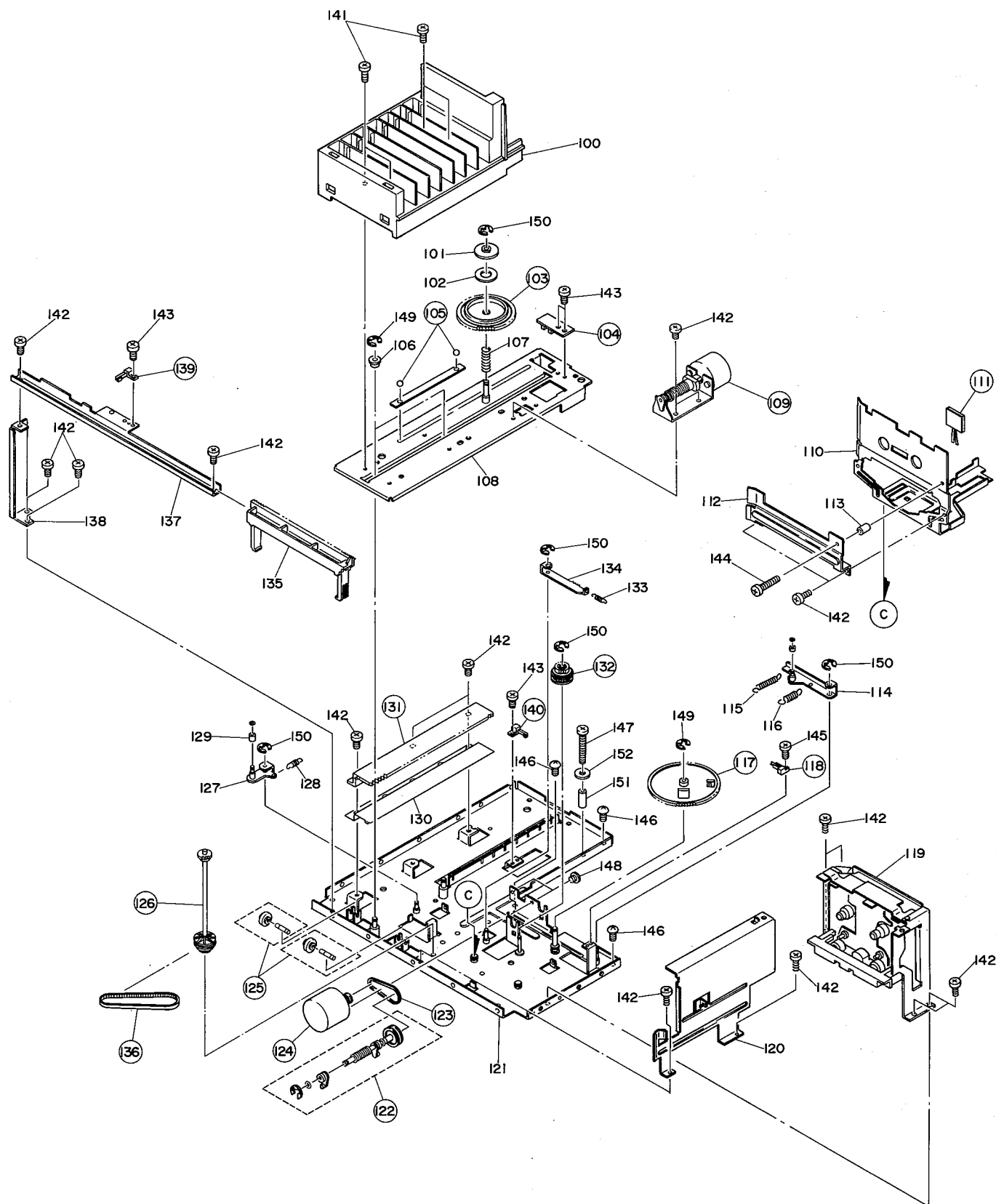
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VR601	M05A09411	VR-Semi 22KB
VR602	M05A09412	VR-Semi 100KB
VR650	M05A09411	VR-Semi 22KB
VR680	M05A09412	VR-Semi 100KB
VR701	M05A09400	VR 20KA (REC LEVEL)
X420	M05A09349	Ceramic OSC
X421	M05A09349	Ceramic OSC
	M05A09512	OSC Unit
Packing		
201	M05A09900	Packing Box
202	M05A09910	Cushion Set
203	M05A09920	Packing Bag
	M05A09940	Instruction Booklet
	M07670945	Warranty Card



PARTS LIST (CABINET)

Symbol No.	Parts No.	Description
1	M05A09136	Top Cover
2	M05A09490	AC Cord 
3		Cord Clamper
4		Back Panel
5		Holder
6		Holder
7	M05A09201	Knob Holder
8		PCB Ass'y
9		Holder
10		Side Chassis (L)
11	M05A09500	Transformer 
12		Holder
13		Main PCB Ass'y
14		Side Chassis (R)
15		Front Chassis
16	M04200354	Push SW (OPEN/CLSOE)
17		Holder
18		PCB Ass'y
19		PCB Ass'y
20		PCB Ass'y
21		Tape Mechanism (TAPE 2)
22		PCB Ass'y
23	M05A09217	Knob Ass'y (Tape 2 EJECT)
24	M05A09100	Front Panel
25	M05A09101	Window Ass'y
26	M05A09132	Cassette Cover (TAPE 1)
27	M05A09133	Cassette Cover (TAPE 2)
28	M05A09710	Tape Counter
29	M05A09713	Counter Belt
30		Bottom Cover
31	M05A09190	Foot
32		Holder
33		Plastic Rivet
34	M05A09200	Knob (POWER)
35		T-Screw T2-4 x 5
36		Screw M3 x 5
37		T-Screw T2-3 x 10
38		Screw M3 x 6
39		T-Screw T-2.6 x 5
40		Washer Head Screw M3 x 5
41		Screw M3 x 12
42	M05A09215	Knob (NEXT/FF/REW)
43	M05A09209	Knob (PLAY)
44	M05A09204	Knob (PROGRAM)
45	M05A09205	Knob (MEMORY)
46	M05A09207	Knob (TRACK/DOLBY/TAPE NO/ SIDE)
47	M05A09206	Knob (CALL/CLEAR)
48	M05A09203	Knob (DIRECTION)
49	M05A09202	Knob (REPEAT)
50	M05A09210	Knob (STOP)
51	M05A09214	Knob (DUBBING)
52	M05A09208	Knob (REC MUTE)
53	M05A09216	Knob (REC)
54	M05A09212	Knob (STOP/PLAY)
55	M05A09213	Knob (FF/REW/PAUSE)
56	M05A09218	Knob (OPEN/CLOSE)

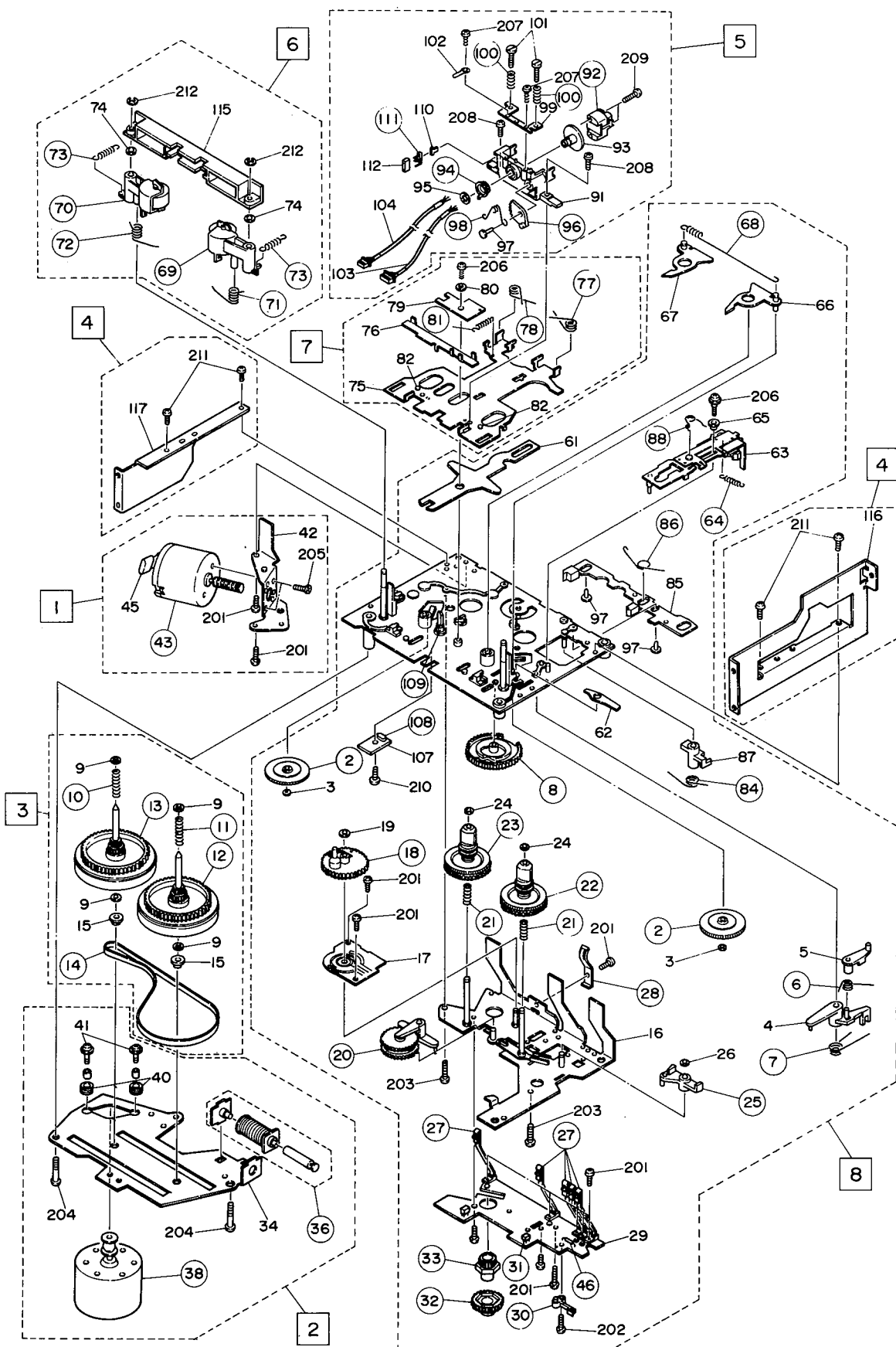
EXPLODED VIEW (LOADING MECHANISM)



PARTS LIST (LOADING MECHANISM)

Symbol No.	Parts No.	Description
100		Cassette Holder
101		Cap
102		Felt
103	M04200732	Gear (2)
104	M04200303	Photo Coupler
105	M07065786	Steel Ball (5/32")
106		Roller
107		Spring
108		Base Ass'y
109	M04200551	Motor Ass'y
110		Holder Ass'y
111	M05237320	LED SLF201C (GRN)
112		Holder
113		Coller
114		Lever Ass'y
115		Spring
116		Spring
117	M04200731	Gear (3)
118	M04200390	SW-Spring (LOADING)
119		Cassette Mechanism (TAPE 1)
120		Holder
121		Chassis Base Ass'y
122	M04200734	Gear Ass'y-1
123	M04200714	Belt
124	M04200552	Motor Ass'y
125	M04200632	Pulley Ass'y
126	M04200736	Gear Ass'y-3
127		Lever
128		Spring
129		Coller
130		Spring
131	M04200733	Gear-6
132	M04200735	Gear-2
133		Spring
134		Lever
135		Link
136	M04200715	Belt
137		Holder
138		Holder
139	M04184390	SW-Spring
140	M05208390	SW-Spring
141		Screw M2.6 x 16
142		T-Screw T2-3 x 8
143		Screw M2.6 x 5
144		Metal Screw
145		Screw M2 x 5
146		Screw M3 x 6
147		Screw M2.6 x 25
148		Screw M2.6 x 3
149		E-Ring (C)-3
150		E-Ring (B)-2
151		Coller
152		Washer

EXPLODED VIEW (TAPE 1 MECHANISM)

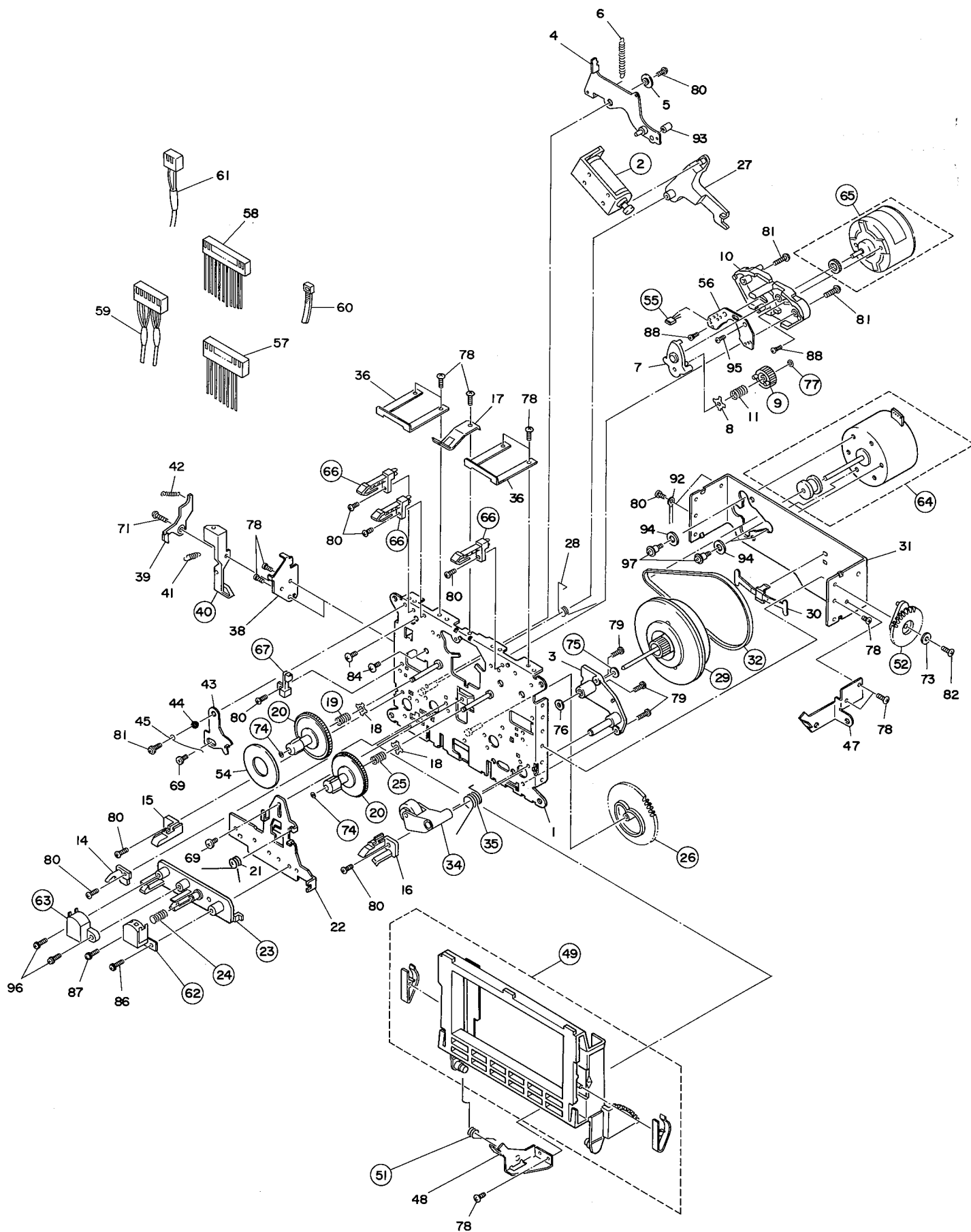


PARTS LIST (TAPE 1 MECHANISM)

Symbol No.	Parts No.	Description
- 1 -		ASSIST MOTOR ASS'Y
42	M04200556	ANGLE (MOTOR)
43		MOTOR ASS'Y (ASSIST)
45		CAPACITANCE
201		DT SCREW
205		SCREW (MOTOR)
- 2 -		BASE (MOTOR)
34		PLATE (MOTOR)
36	M04200531	PLUNGER ASS'Y
38 ✓	M04200554	MOTOR ASS'Y
40		CUSHION (MOTOR)
41		SCREW (MOTOR)
204		SCREW
- 3 -		FLYWHEEL ASS'Y
9		WASHER
10	M04200765	C-SPRING
11	M04200766	C-SPRING
12	M04200756	FLYWHEEL ASS'Y A
13	M04200757	FLYWHEEL ASS'Y B
14	M04200717	BELT MAIN ✓
15		METAL
- 4 -		HOLDER ASS'Y
116		HOLDER R
117		HOLDER L
211		DT SCREW
- 5 -		HEAD STAND ASS'Y
91		HEAD STAND
92	M04200520	R/P/E HEAD
93		HOLDER (HEAD)
94	M04200744	GEAR A
95		WASHER
96	M04200745	GEAR B
97		BOTH
98	M04200789	SPRING
99		PLATE (AZIMUTH)
100	M04200790	C-SPRING
101		SCREW (HEAD AZIMUTH ADJ.)
102		LUG
103		SHIELDING WIRE
104		SHIELDING WIRE
110		LIGHT TUBE
111	M04200307	TR-TPS605
112		BOTH
207		SCREW
208		SCREW
209		SCREW (HEAD)
- 6 -		PINCH ROLLER ASS'Y
69	M04200720	PINCH ROLLER ARM ASS'Y-R
70	M04200721	PINCH ROLLER ARM ASS'Y-L
71	M04200780	SPRING
72	M04200781	SPRING
73	M04200782	SPRING
74		WASHER
115		GUIDE (CASSETTE)
212		E-RING

Symbol No.	Parts No.	Description
- 7 -		HEAD BASE ASS'Y
75		HEAD BASE
76		HEAD SLIDER
77	M04200783	SPRING
78	M04200784	SPRING
79		PLATE (HOLDER)
80		WASHER
81	M04200785	T-SPRING
82		BOTH
206		SCREW
- 8 -		REEL REST ASS'Y
1		CHASSIS ASS'Y
2	M04200739	GEAR A
3		WASHER
4		TRIGGER ARM
5		TRIGGER ARM B
6	M04200763	SPRING
7	M04200764	SPRING
8	M04200740	CAM GEAR
16		REEL CHASSIS ASS'Y
17		PCB-B
18	M04200741	ASSIST GEAR
19		WASHER
20	M04200634	TENSION ASS'Y
21	M04200767	C-SPRING
22	M04200703	F REEL ASS'Y
23	M04200704	R REEL ASS'Y
24		WASHER
25	M04200607	F/R ARM
26		WASHER
27	M04200396	REC. SWITCH
28	M04200656	SPRING
29		PCB-A
30	M04200376	SW-LEAF
31	M04200306	PHOTO SENSER
32	M04200742	GEAR H
33	M04200743	GEAR G
46	M04200326	DIODE SR-1-K-2
61		REVERSE ARM
62		CUE ARM
63		F/R LEVER
64	M04200768	C-SPRING
65		COLLER
66		ARM A ASS'Y R
67		ARM A ASS'Y L
68	M04500769	T-SPRING
84	M04200786	SPRING
85		BLAKE PLATE ASS'Y
86	M04200787	SPRING
87		TIMING ARM
88	M04200788	SPRING
107		P-BOARD
108	M04200327	LE.DIODE TLR-121
109		LIGHT TUBE A
201		SCREW
202		SCREW
203		SCREW
206		SCREW
210		SCREW

EXPLODED VIEW (TAPE 2 MECHANISM)

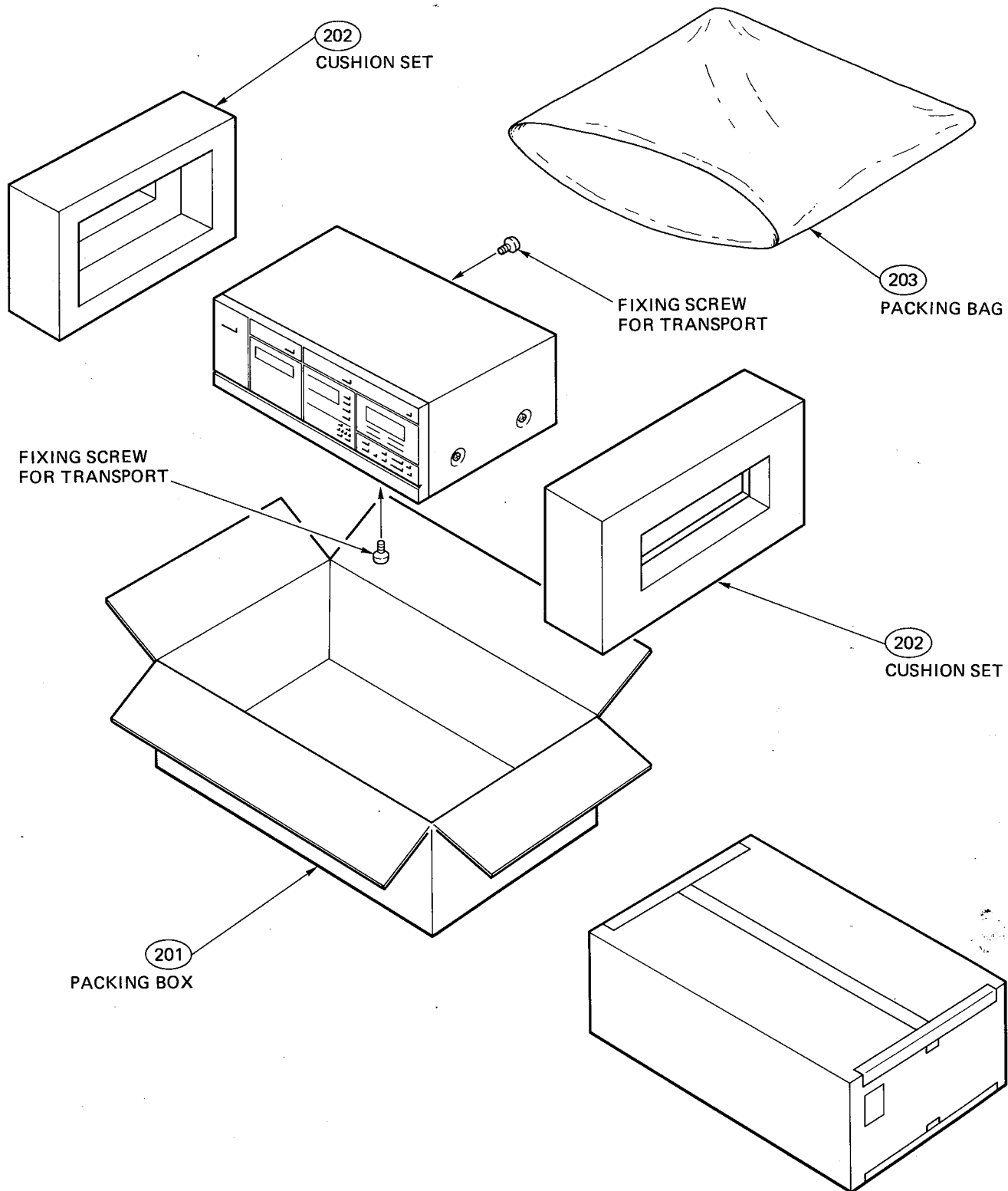


PARTS LIST (TAPE 2 MECHANISM)

Symbol No.	Parts No.	Description
1	M05A09530	Chassis Ass'y (A)
2		Solenoid
3		Housing Ass'y (R)
4		Shift Arm Ass'y (B)
5	M05A09730	Shift Arm Collar
6		Shift Arm Spring
7		Idler Arm Ass'y
8		Idler Washer
9		Idler Gear
10		Idler Base
11		Clutch Spring
12		Motor Gear
13		Cassette Guide
14		Cassette Guide (L)
15		Cassette Guide (R)
16		Cassette Clamp
17	M05A09762	Reel Washer
18		Reel Spring
19	M05A09702	Reel Rest Ass'y
20	M05A09660	Head Chassis Spring (A)
21		Head Chassis (A)
22	M05A09760	Head Base
23		Head Spring
24	M05A09763	Reel Spring (C)
25	M05A09731	Play Gear
26		PL Arm
27	M05A09756	PL Arm Spring
28		Flywheel Ass'y
29		Capstan Spacer
30		Motor Holder (A)
31	M05A09714	Belt
32		—
33	M05A09720	P Roller Ass'y (R)
34	M05A09764	P Roller Spring (R)
35		SW Protector (B)
36	M05A09653	—
37		Eject Holder
38		Cassette Stopper
39		Ejector
40		Eject Spring (A)
41		Eject Spring (B)
42		Eject Lock Arm
43		Lock Arm Collar
44		Lock Arm Spring
45		—
46		Case Holder (R)
47		Case Holder (L)
48	M05A09147	Cassette Holder Ass'y
49		—
50	M05A09761	Case Spring
51	M05A09750	Damper Ass'y
52		—
53	M05A09315	Reel Magnet (8)
54		Hall IC
55		Hall IC PCB (U)
56		8P Wire Ass'y
57		11P Wire Ass'y
58		6P Head Wire Ass'y
59		Nylon Band
60		

Symbol No.	Parts No.	Description
61	M05A09520	2P Head Wire Ass'y
62		RP Head
63		Erase Head
64		Motor Ass'y
65	M05A09552	Reel Motor Ass'y
66	M05A09375	Leaf Switch
67		Leaf Switch
68	M05A09781	—
69		Screw (A)
70		—
71		Screw (B)
72		—
73		Plain Washer (L)
74		Polyslider Washer (1.6φ x 3.5φ x 0.5t)
75		Polyslider Washer (2.1φ x 5.0φ x 0.4t)
76		Nylon Washer
77		Polyslider Washer (1.7φ x 3.5φ x 0.5t)
78	M05A09783	Tap Tite Screw 2 x 4
79		Bind Tap Tite Screw 2 x 4
80	M05A09783	Tap Tite Screw 2 x 5
81		Tap Tite Screw 2 x 8
82	M05A09783	Tap Tite Screw 2 x 10
83		—
84	M05A09783	Flat Screw 2.6 x 4
85		—
86	M05A09783	Binding Screw 2 x 11
87		Washer Head Screw 2 x 10
88	M05A09783	Sems Screw
89		—
90	M05A09783	—
91		—
92	M05A09783	Cord Clamp
93		Shift Arm Collar
94	M05A09783	Motor Cushion
95		Tapping Screw 2 x 5
96	M05A09783	Binding Screw 2 x 12
97		Soldek (B)
98	M05A09783	—
99		—
100	M05A09783	—
		—

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